ORDER NO. HAD8602350C0
A6

Service Manual

Compact Disc Player

SL-PJ33

COMPACT disc DIGITAL AUDIO

DIGITAL

Compact Disc Player

Color

(K)...Black Type

Areas

[M] .....U.S.A.
[MC]...Canada.
[E] .....Switzerland and Scandinavia.
[EK]....United Kingdom.
[XL]....Australia.
[EG] ...F.R. Germany.
[EB]....Belgium.
[EH] ...Holland.
[EF]....France.
[Ei] .....Italy.
[XA]....Southeast Asia, Oceania, Africa, Middle Near East and Central South America.
[PA]....East PX.
[PE]....European Military.
[PC]....European Audio Club.

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Technics

SPECIFICATIONS

■ Audio

No. of channels: 2 (left and right, stereo)
Frequency response: 4—20,000 Hz ±0.3 dB
Dynamic range: More than 96 dB
S/N ratio: More than 100 dB
Harmonic distortion: 0.0015% (1 kHz, 0 dB)
Total harmonic distortion: 0.003% (1 kHz, 0 dB)
Channel separation: More than 100 dB
Wow and flutter: Below measurable limit
Low-pass filter: High-resolution digital filter

■ Signal Format

Sampling frequency: 44.1 kHz
Correction system: Technics Super Decoding Algorithm
D-A conversion: 16-bit linear

■ Pickup

Type: Fine-focus, one beam

Light source: Semiconductor laser
Wavelength: 780 nm
Traverse system: High-speed linear access system
Spindle system: Brushless DD motor

■ Functions

Automatic play: All tracks.
Random access play: Track number or index number.
Repeat play: Entire disc or programmed tracks.
A-B repeat play.
Program repeat play.
Search: Forward/backward track skip.
Forward/backward index skip (using remote control unit).
Forward/backward manual search.
Program play: For up to 20 tracks
Index programming (max. 10 steps)
Display: Total tracks.
Programmed tracks.
Current track.
Index numbers.
The following four time modes display minutes and seconds according to the time mode select button setting:
① Disc remaining playing time.
② Track number and remaining playing time of current track.
③ Disc elapsed playing time.
④ Track number and elapsed playing time from beginning of current track.
Repeat indicator.
A-B repeat indicator.
Music scan indicator.
Auto space indicator.
Play indicator.
Programmed order indicator.
Pause indicator.
Disc indicator.
Over indicator.
Disc loading: Motor-driven horizontal type.
Headphone output level: 15 mW max. 32 Ω (fixed)

■ General

Power supply: For U.S.A. and Canada:
AC 120V, 60Hz
For Continental Europe:
AC 220V, 50Hz
For United Kingdom and Australia:
AC 240V, 50Hz
For Others:
AC 110~127/220~240V, 50/60Hz
Power consumption: 16 W
Output voltage: 2 V (at 0 dB)
Output impedance: Approx. 600Ω
Load impedance: More than 10 kΩ
Dimensions (W×D×H): 31.5×26.7×7.5 cm (12-13/32"×10-1/2"×2-15/16")
[When disc holder is opened: 39.7 cm (15-5/8") (D)]
Weight: 3.7 kg (8 lbs.)

■ Infrared remote control unit

Dimensions (W×D×H): 6.5×15.5×1.8 cm
Batteries: UM-3 "AA" batteries or IEC R6 or equivalent (1.5 V×2)
Remote control functions: Numeric buttons (0 to 9)
Memory button
Clear button
A-B repeat button
Repeat button
Music scan button
Recall button
Index button
Time mode select button
Forward and backward index skip buttons
Forward and backward search buttons
Forward and backward skip buttons
Stop button
Pause button
Play button
Weight: 140 g (including batteries)

Specification are subject to change without notice for further improvement.
Weight and dimensiones are approximate.

This service manual does not include "FUNCTION", "TERMINAL FUNCTION OF LSI" and "TROUBLESHOOTING".
For these items, please refer to Service Manual SL-P300 (Order No. HAD8511289C0).

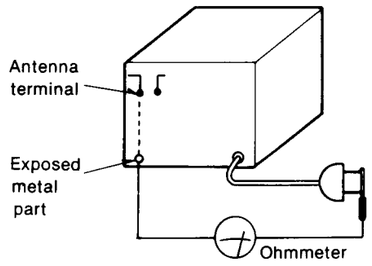
■ SAFETY PRECAUTION (This "safety precautions" is applied only in U.S.A.)

1. Before servicing, unplug the power cord to prevent an electric shock.
2. When replacing parts, use only manufacturer's recommended components for safety.
3. Check the condition of the power cord. Replace if wear or damage is evident.
4. After servicing, be sure to restore the lead dress, insulation barriers, insulation papers, shields, etc.
5. Before returning the serviced equipment to the customer, be sure to make the following insulation resistance test to prevent the customer from being exposed to a shock hazard.

• INSULATION RESISTANCE TEST

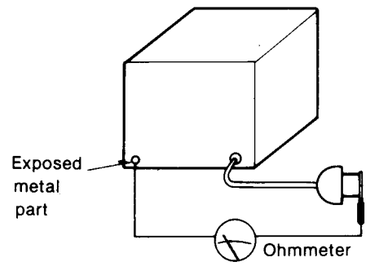
1. Unplug the power cord and short the two prongs of the plug with a jumper wire.
2. Turn on the power switch.
3. Measure the resistance value with ohmmeter between the jumpered AC plug and each exposed metal cabinet part, such as screwheads antenna, control shafts, handle brackets, etc. Equipment with antenna terminals should read between 3MΩ and 5.2MΩ to all exposed parts. (Fig. A) Equipment without antenna terminals should read approximately infinity to all exposed parts. (Fig. B)

Note: Some exposed parts may be isolated from the chassis by design. These will read infinity.



(Fig. A)

Resistance = 3MΩ—5.2MΩ



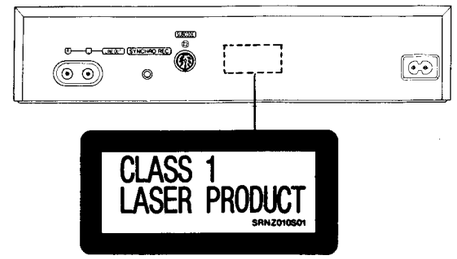
(Fig. B)

Resistance = Approx ∞

4. If the measurement is outside the specified limits, there is a possibility of a shock hazard. The equipment should be repaired and rechecked before it is returned to the customer.

■ PRECAUTION OF LASER DIODE

Caution: This product utilizes a laser diode.
ADVARSEL: I dette a apparat anvendes laser.

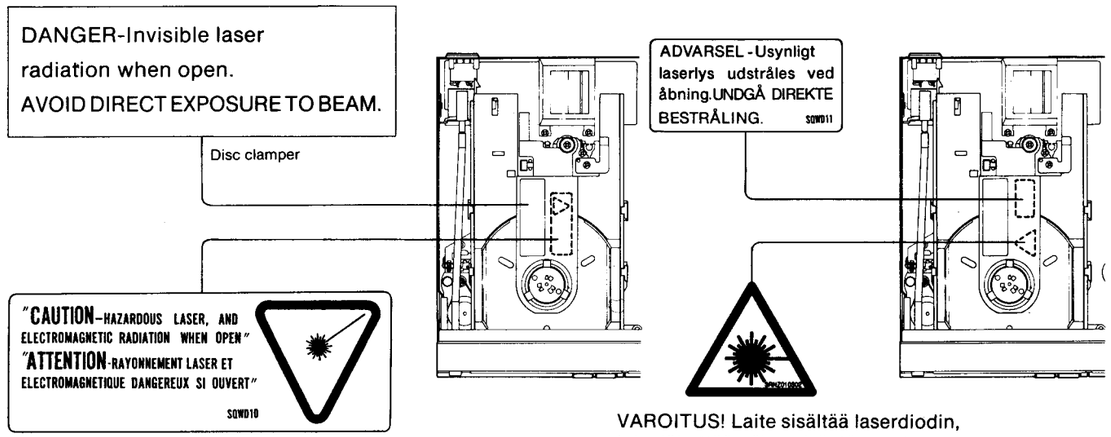


Obs:
Apparaten innehåller laser
Komponent av höger laserklass
än klass 1.

• Use of caution labels

Note: ○ Mark is used, × Mark is not used.

Areas	Disc clamper	SQWD10	SQWD11	SRNZ010S01	SRNZ010S02
[M], [XA], [XM] [EC], [PA], [PE] [PC]	○	×	×	×	×
[MC]	○	○	×	×	×
[E]	○	×	○	○	○
[EK], [XL], [EG] [EB], [EH], [EF] [Ei]	○	×	×	○	○

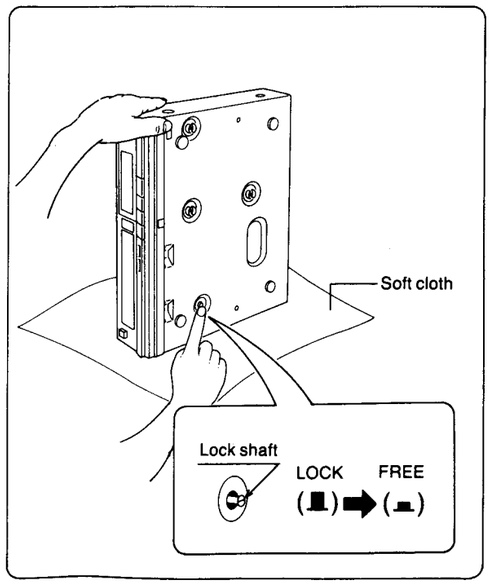

DANGER-Invisible laser radiation when open.
AVOID DIRECT EXPOSURE TO BEAM.
Disc clamper
"CAUTION-HAZARDOUS LASER, AND ELECTROMAGNETIC RADIATION WHEN OPEN"
"ATTENTION-RAYONNEMENT LASER ET ELECTROMAGNETIQUE DANGEREUX SI OUVERT"
SQWD10
ADVARSEL - Usynligt laserlys udstråles ved åbning. UNDGÅ DIREKTE BESTRÅLING.
SQWD11

VAROITUS! Laite sisältää laserdiodin, joka lähettää näkymätöntä silmille vaarallista lasersäteilya

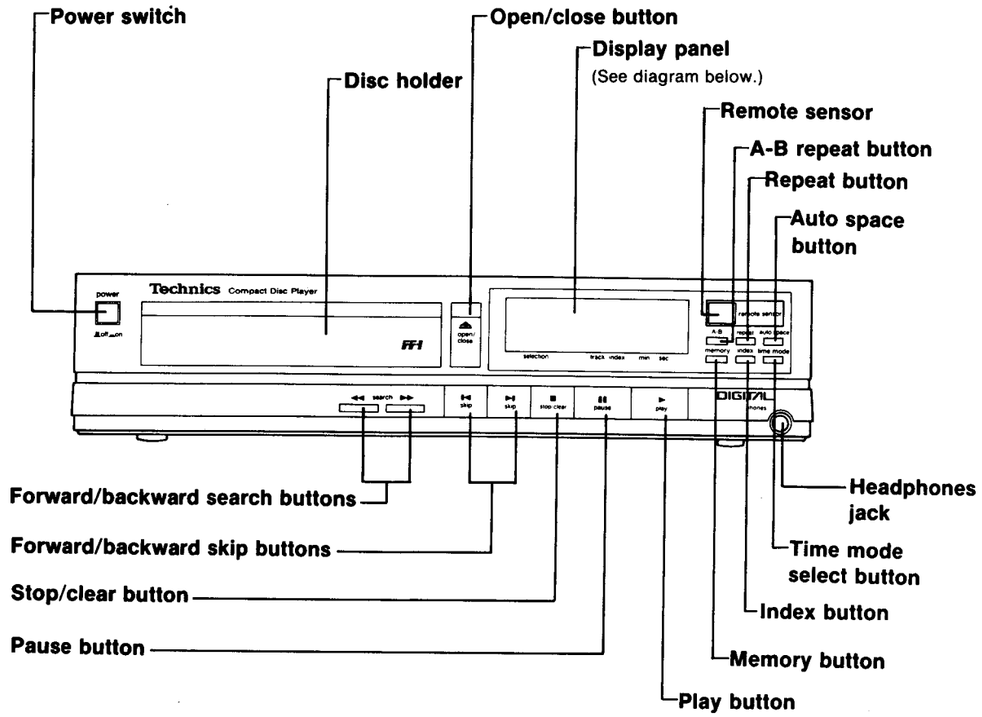
■ BEFORE USING THIS UNIT

1. Place a soft cloth under the unit to protect it from scratches.
2. Press the lock shaft on the bottom panel to the in position (🔒→🔓).

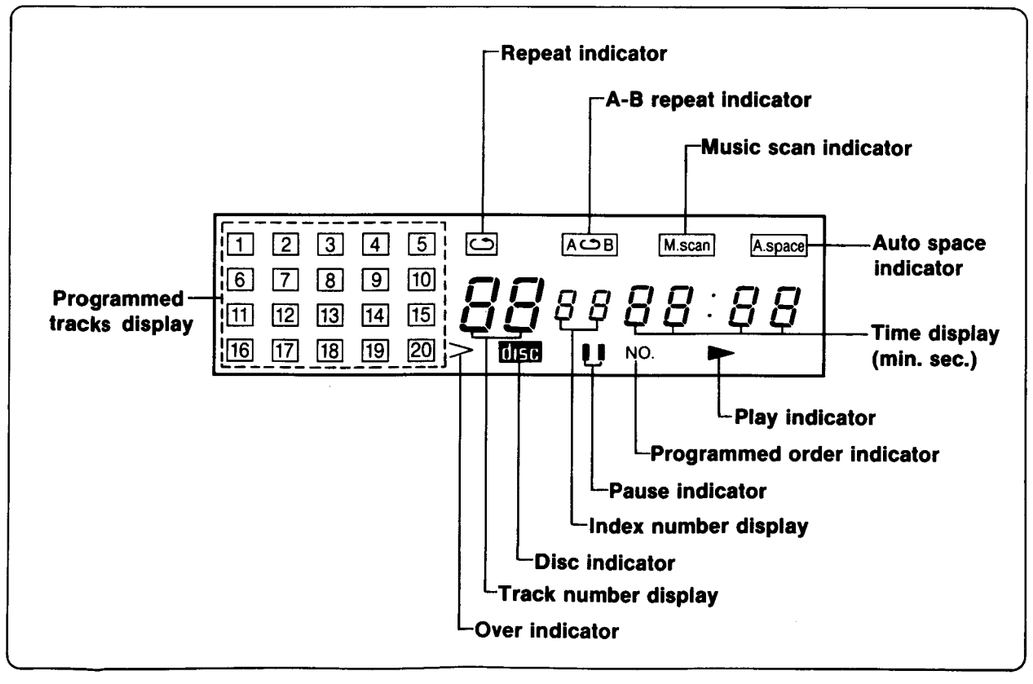
NOTE:
IF THE PLAYER IS TRANSPORTED AGAIN, PERFORM THE FOLLOWING, STEPS:
1) Remove the disc from the holder.
2) Press the lock shaft to the out position (🔓→🔒).
CAUTION:
Do not transport the player without locking the lock shaft. Severe damage will result.



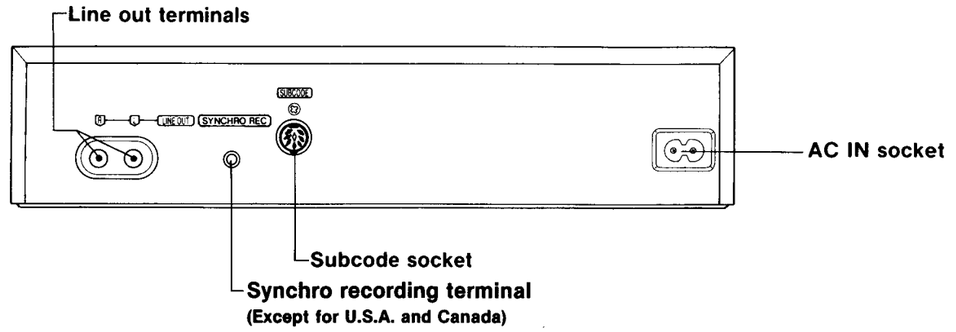
■ LOCATION OF CONTROLS



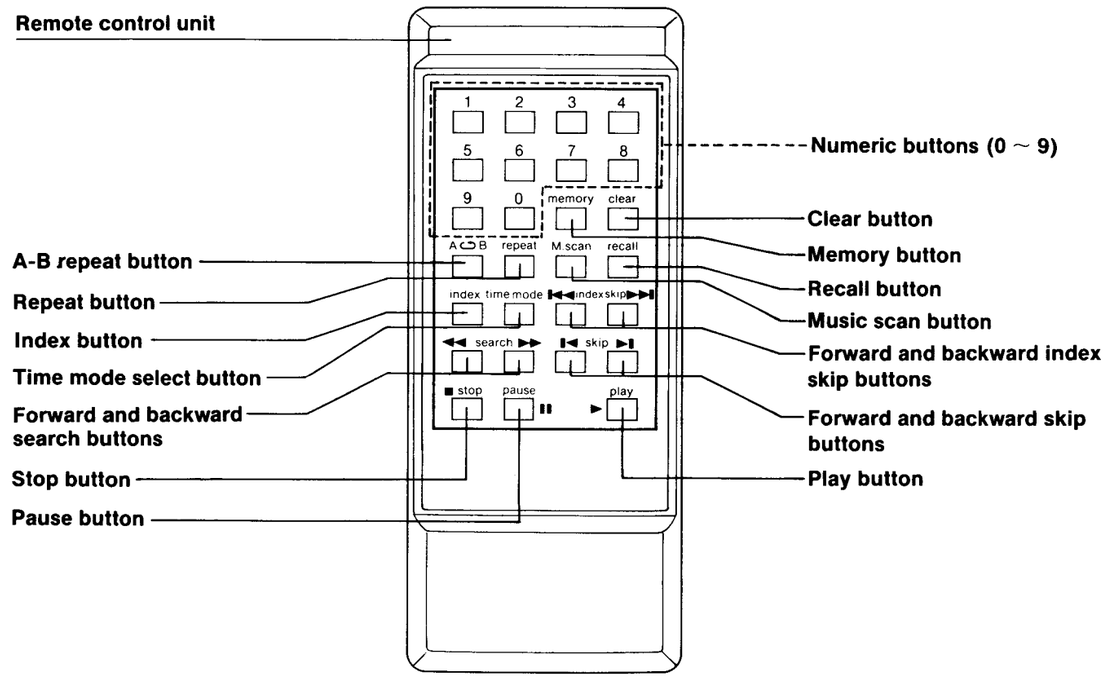
(Display panel section)



(Rear panel of this player)



■ REMOTE CONTROL UNIT



When using the remote control unit, press the buttons slowly and accurately to avoid mistaken operation.

Remote control unit facilities

- The remote control unit has the following capabilities not available on the player.

① Numeric buttons for entering track and index numbers, and variable scan time.
② Clear button for cancelling program play entries one by one in reverse order.
③ Recall button for checking the programmed track and index numbers.
④ Forward and backward index skip buttons.
⑤ Music scan button

- The following operations are not possible using the remote control unit.

① Power on/off
② Disc holder open/close
③ Auto space

■ Notes

- Always aim the remote control unit at the front panel receiver.
- The remote control unit can be used at an angle range of up to 30° from the direction in which the front panel faces.
- The remote control unit can not be used from a distance of more than 7 meters (23 ft.).

■ Remote control operation

Point the remote control unit at the front panel receiver and press the appropriate button(s). The front panel remote control indicator illuminates as long as each button is held down.

ORDER NO. HAD8706192S0
A6

Service Manual

Compact Disc Player

SL-PJ33

Supplement

COMPACT disc DIGITAL AUDIO

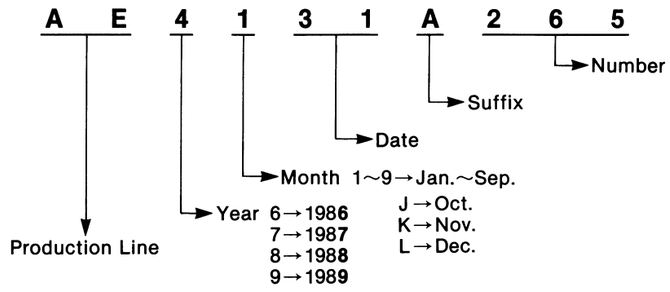
DIGITAL

Please file and use this supplement manual together with the service manual for Model No. SL-PJ33, Order No. HAD8602350C0.

Note:

- This supplement has been issued to inform you that the optical servo P.C.B. has been changed in units having serial number suffixes "F" or later. (Refer to "How to read the serial number" shown below).

● How to read the serial number



■ REPLACEMENT PARTS LIST

Ref. No.	Change of Part No. OLD → NEW		Description	Remarks
VARIABLE RESISTOR				
VR106	——	**EVND1AA00B53**	Tracking Balance Adj., 5KΩ (B)	Addition
RESISTORS				
R112	ERDS2TJ683	**ERDS2TJ473**	Carbon, 1/4W, 47KΩ, ±5%	Change
R113	ERDS2TJ104	**ERDS2TJ154**	Carbon, 1/4W, 150KΩ, ±5%	Change
R114	ERDS2TJ474	**ERDS2TJ824**	Carbon, 1/4W, 820KΩ, ±5%	Change
R119	ERDS2TJ222	**ERDS2TJ152**	Carbon, 1/4W, 1.5KΩ, ±5%	Change
R191, 192	——	**ERDS2TJ102**	Carbon, 1/4W, 1KΩ, ±5%	Addition
CAPACITORS				
C126	RCBS1H220JLY	**RCBS1H101KBY**	Ceramic, 50V, 100pF, ±10%	Change
C148	ECKD1H102KB	**RCBS1H102KBY**	Ceramic, 50V, 0.001μF, ±5%	Change
C191, 192	——	**RCBS1H820KBY**	Ceramic, 50V, 82pF, ±10%	Addition
C193, 194	——	**RCBS1H102KBY**	Ceramic, 50V, 0.001μF, ±5%	Addition

Technics

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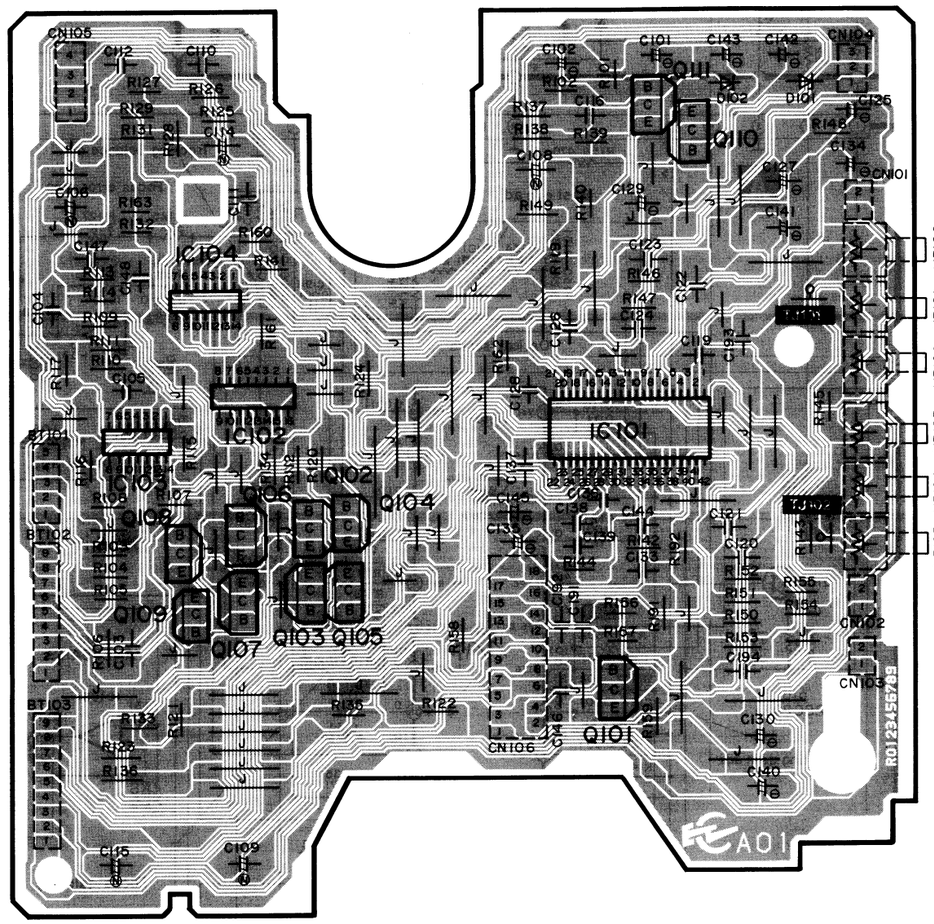
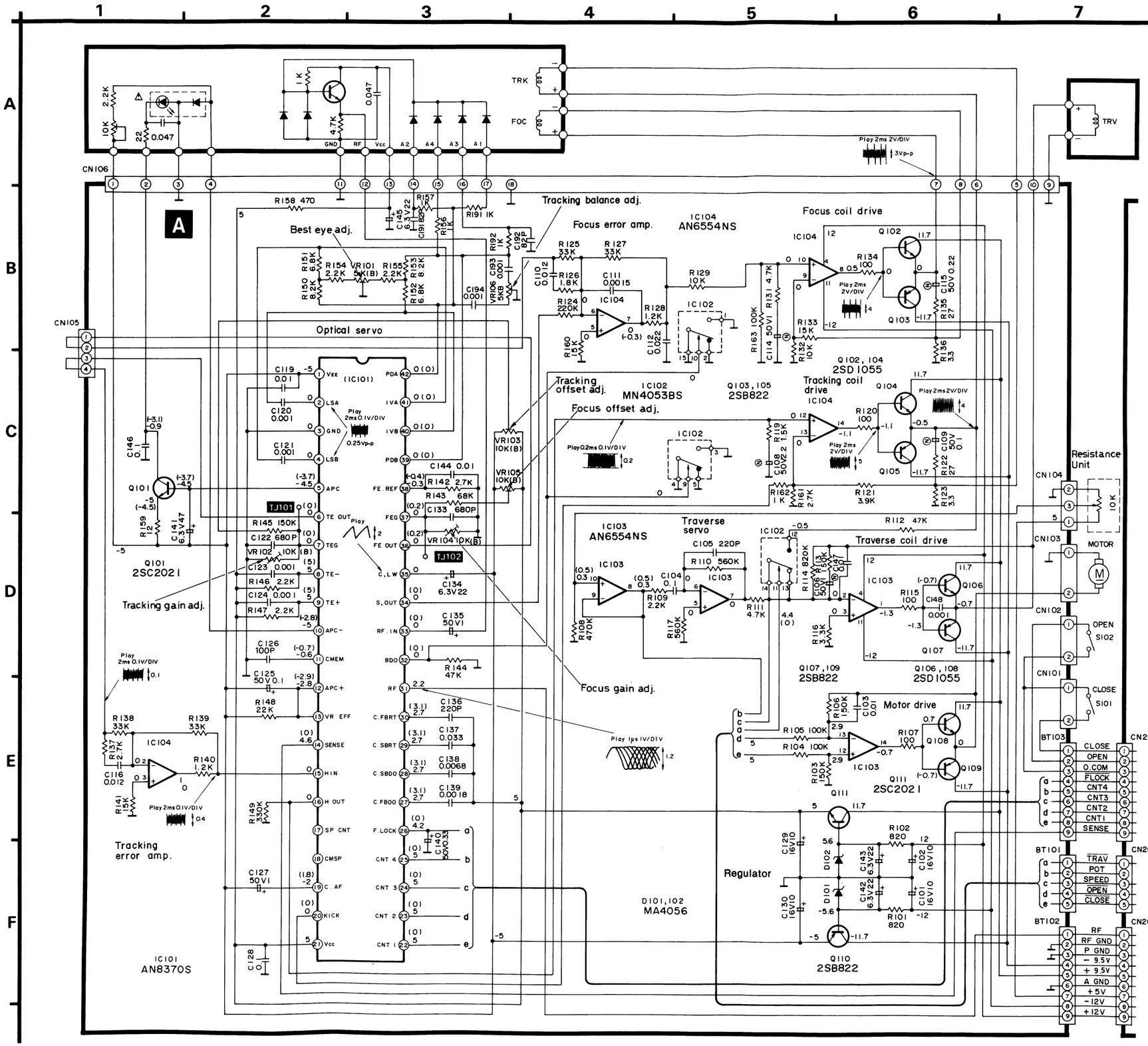
Minato-ku, Tokyo 105, Japan

■ PRINTED CIRCUIT BOARD

A (Optical servo P.C.B.)



■ SCHEMATIC DIAGRAM (Optical servo circuit)



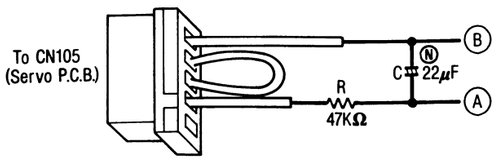
■ MEASUREMENTS AND ADJUSTMENTS

• Addition of tracking balance adjustment

TRACKING BALANCE ADJUSTMENT

Note: This adjustment must be done after all previous electrical adjustments have been done. (VR101, VR102, VR103, VR104 and VR105)

1. Remove the shorting connector from connector CN105 of the servo P.C.B. and connect the **test fixture** for tracking balance adjustment (**SZZP1053F**), to it.
2. Turn **ON** the power switch of the player and insert a test disc (**SZZP1014F** or **SZZP1054C**).
3. Set the player to the play mode and play **track No. 1**.
4. Connect CH-1 of the oscilloscope to point Ⓐ (+) and point Ⓑ (−) of the test fixture as shown in **Fig. A**.
   Oscilloscope setting: VOLT..... 20mV
   SWEEP ..... 1msec.
   INPUT ..... DC
5. Adjust **VR106** so that the DC voltage is **0±5mV** as shown in **Fig. B**.
6. Disconnect the test fixture, and reinsert the shorting connector to **CN105**.



Test fixture (SZZP1053F)

Fig. A

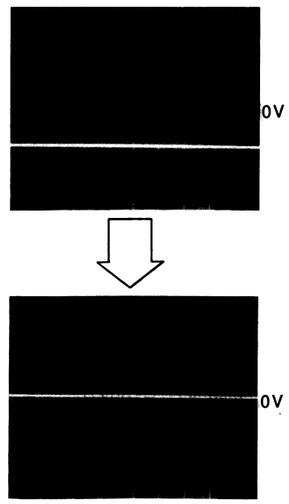


Fig. B

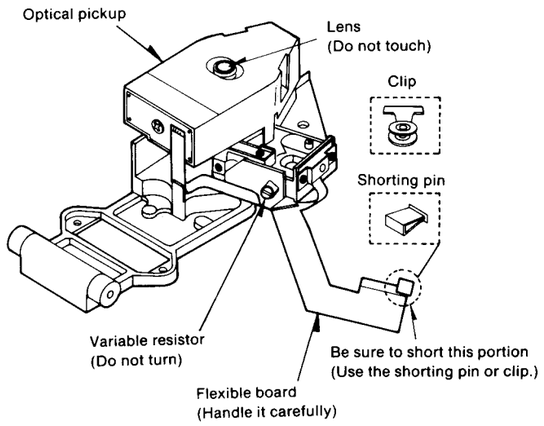
Printed in Japan
H870708300 AM

■ HANDLING PRECAUTIONS FOR OPTICAL PICKUP

The laser diode in the optical pickup may break down due to potential difference caused by static electricity of clothes or human body.
So, be careful of electrostatic breakdown during repair of the optical pickup.

• Handling of optical pickup

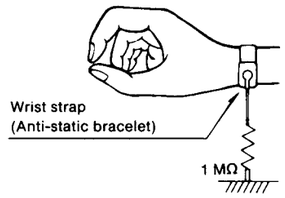
1. Do not give excessive shock to the optical pickup because it is of extremely precise structure.
2. To prevent the breakdown of the laser diode, an anti-static shorting pin is inserted into the flexible board. When removing or connecting the short pin, finish the job in as short a time as possible.
3. Take care not to apply excessive stress to the flexible board.
4. Do not turn the variable resistor (laser power adjustment). It has already been adjusted.

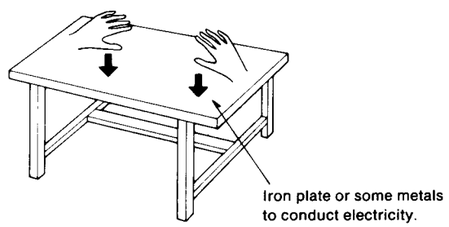


• Grounding for electrostatic breakdown prevention

1. Human body grounding
   Use the anti-static wrist strap to relieve the static electricity from your body.
2. Work table grounding
   Put a conductive material (sheet) or steel sheet on the area where the optical pickup is placed, and ground the sheet.

Caution:
The static electricity of your clothes will not be grounded through the wrist strap. So, take care not to let your clothes touch the optical pickup.



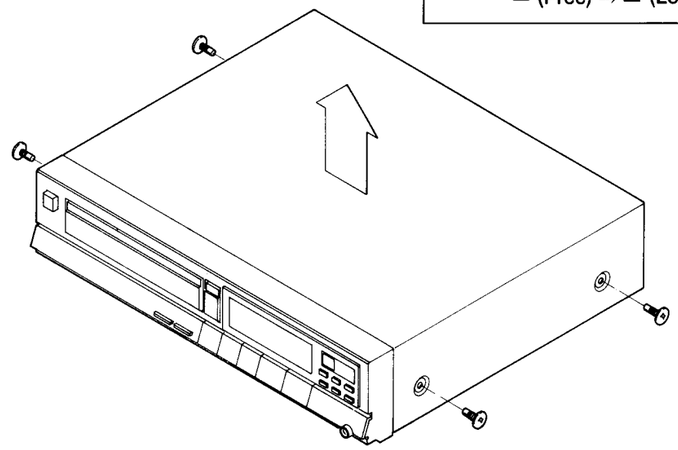


■ DISASSEMBLY INSTRUCTIONS

CAUTION:
- It is very dangerous to look at or touch laser radiation. (Laser radiation is invisible.)
- With the unit turned "on", laser radiation is emitted from the pickup lens.
- When doing the job, removing the cabinet and disc clamper of this unit, be sure to turn the power supply off.

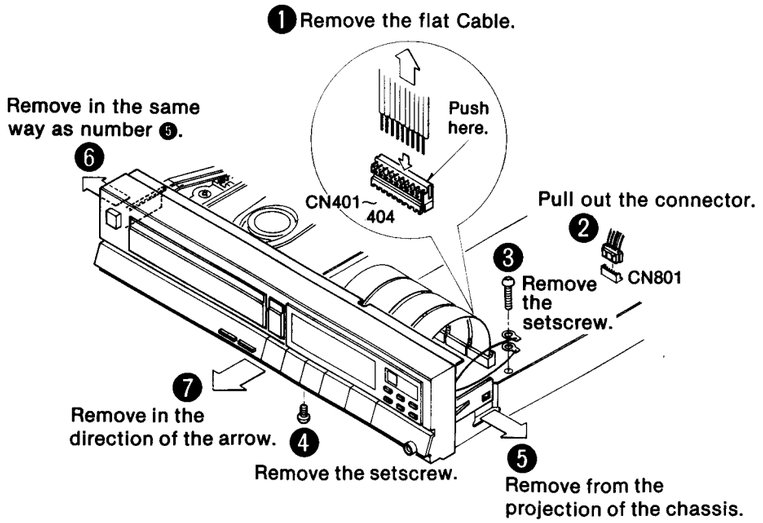
Ref. No. 1	How to remove the cabinet
Procedure 1	• Remove the 4 setscrews.

Note: Locking the lock shaft at the bottom of the unit. (See page 4)
▬ (Free) → ▮ (Lock)



Ref. No. 2	How to remove the front panel
Procedure 1➡2	• Remove in the numerical order shown.

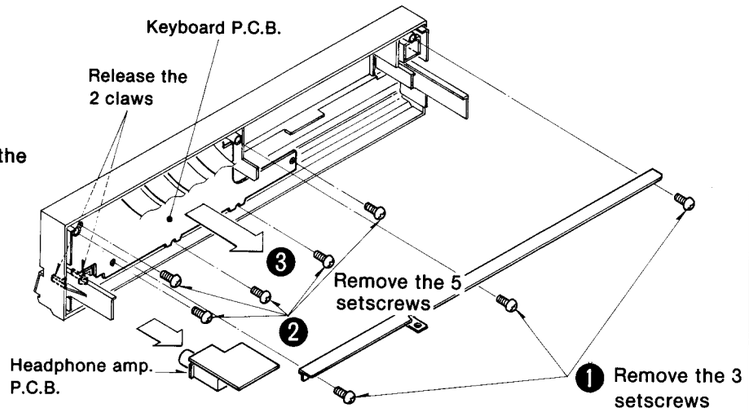
Note: **How to remove the flat cable.**
Pull out the flat cable while pressing the connector.



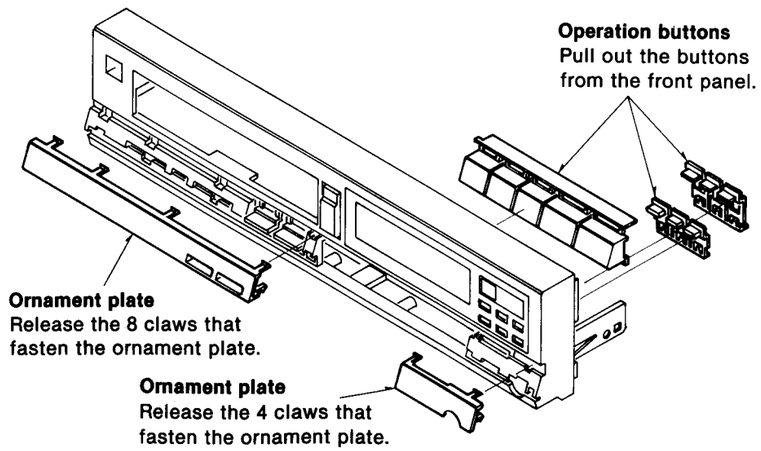
Ref. No. 3	How to remove the keyboard P.C.B.
Procedure 1➡2➡3	• Remove in the numerical order shown.

How to remove the Headphone amp. P.C.B.

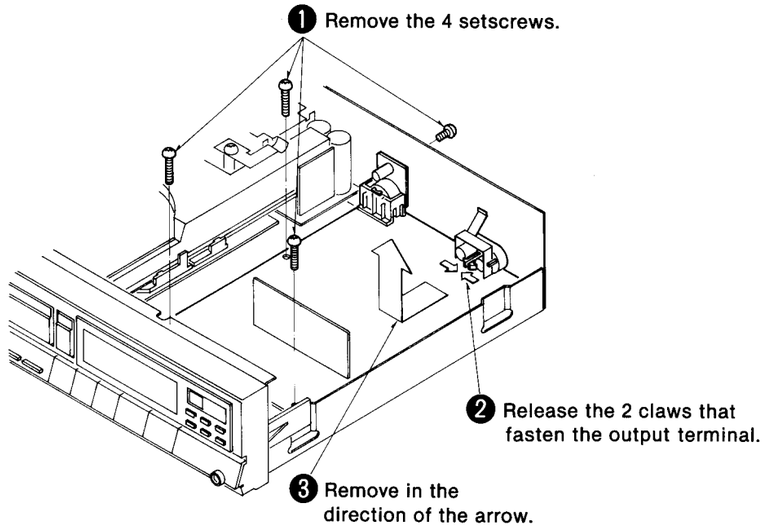
• Release the 2 claws that fasten the headphone amp. P.C.B.



Ref. No. 4	How to remove the operation button and ornament plate
Procedure 3➡4	

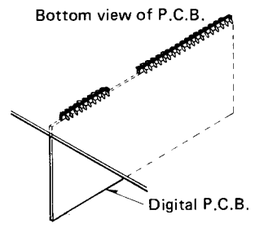

Operation buttons
Pull out the buttons from the front panel.
Ornament plate
Release the 8 claws that fasten the ornament plate.
Ornament plate
Release the 4 claws that fasten the ornament plate.

Ref. No. 5	How to remove the main P.C.B.
Procedure 1➡5	• Remove in the numerical order shown.



How to remove the digital P.C.B.

1. Remove the main P.C.B. and turn it over.
2. Remove the solder of the digital P.C.B. by using a solder sucker.

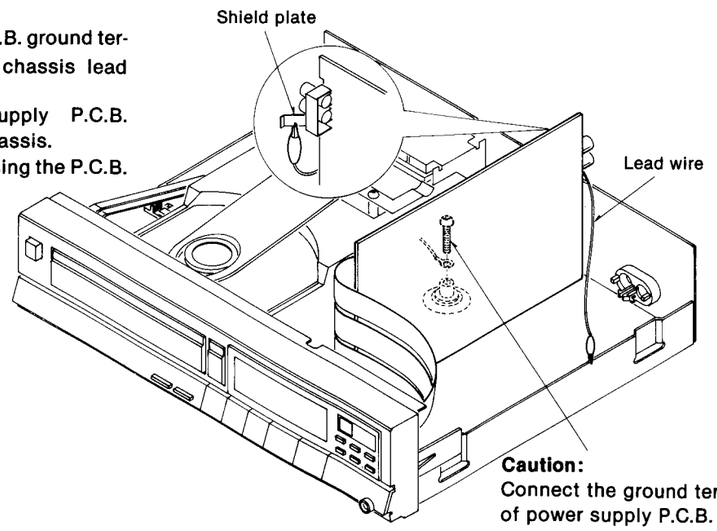


How to check the main P.C.B.

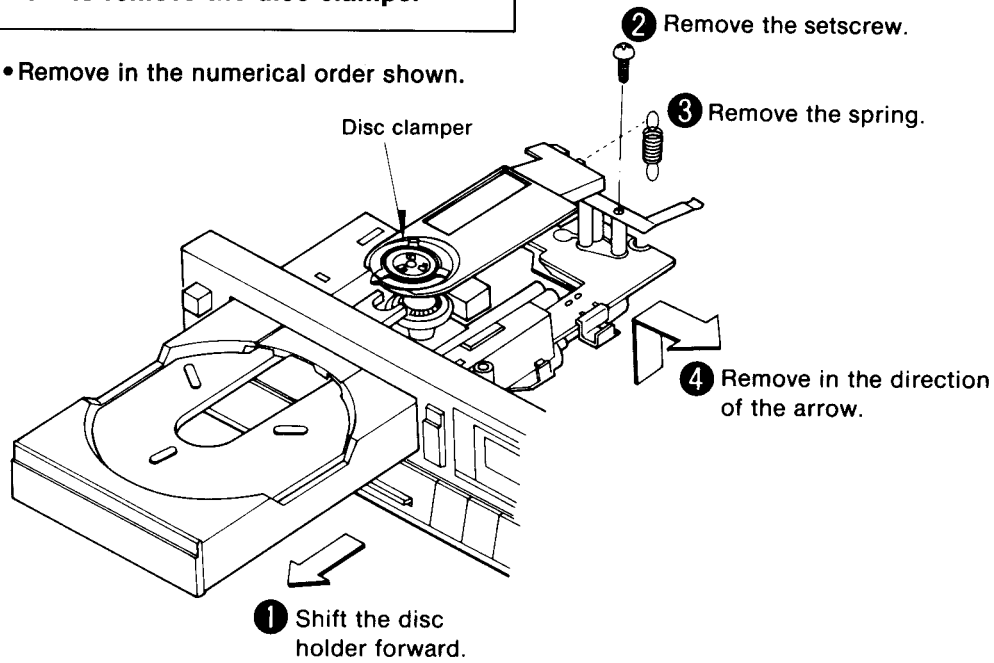
• When checking the soldered surfaces of the main P.C.B. and replacing the parts, do as shown.

Cautions:

1. Be sure to connect the P.C.B. ground terminal (shield plate) and chassis lead wire.
2. Connect the power supply P.C.B. ground terminal to the chassis. (Do the job as shown by using the P.C.B. setscrew.)

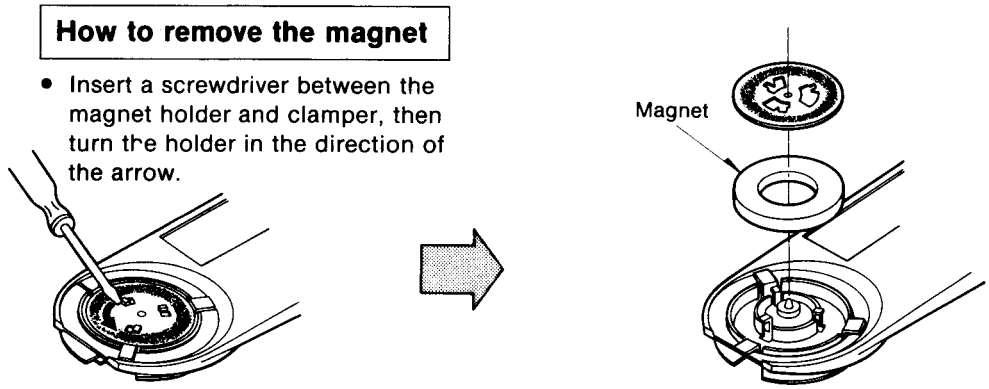


Ref. No. 6	How to remove the disc clamper
Procedure 1➡6	• Remove in the numerical order shown.


❷ Remove the setscrew.
❸ Remove the spring.
Disc clamper
❹ Remove in the direction of the arrow.
❶ Shift the disc holder forward.

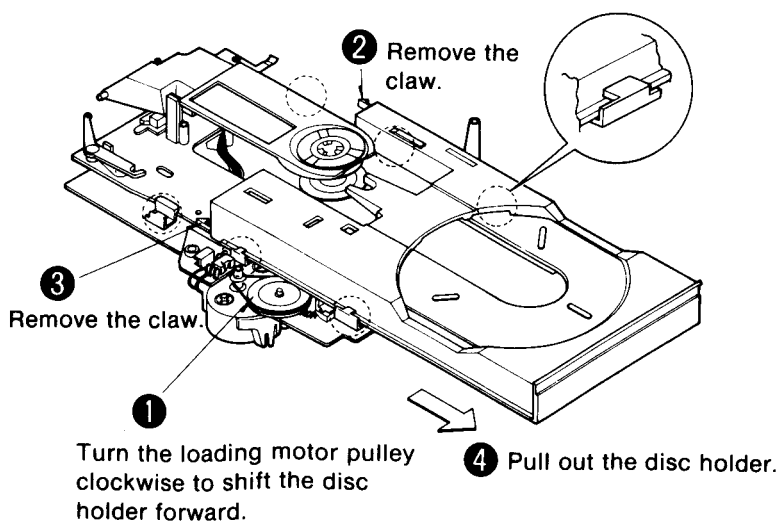
How to remove the magnet

- Insert a screwdriver between the magnet holder and clamper, then turn the holder in the direction of the arrow.

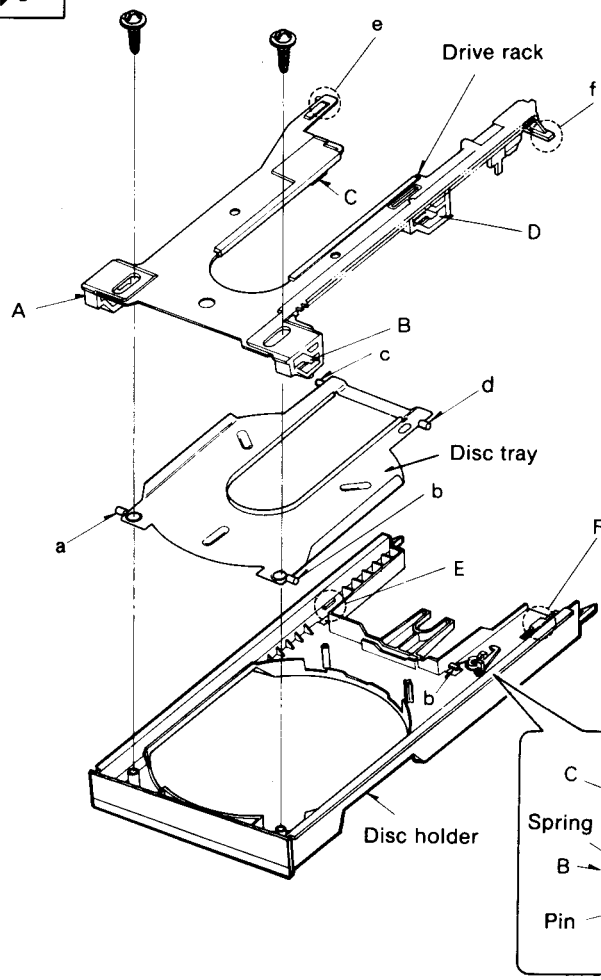


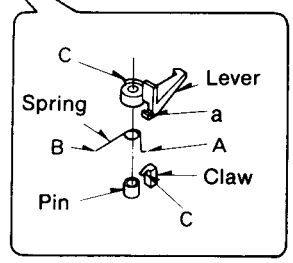
Ref. No. 7	How to remove the disc holder
Procedure 1➡2➡7	• Remove in the numerical order shown.

Caution for fitting
The disc holder should be fitted in the groove of loading base of 6 portions.


❷ Remove the claw.
❸ Remove the claw.
❶ Turn the loading motor pulley clockwise to shift the disc holder forward.
❹ Pull out the disc holder.

Ref. No. 8	How to remove the disc tray and drive rack
Procedure 1➡7➡8	• Remove the 2 setscrews.



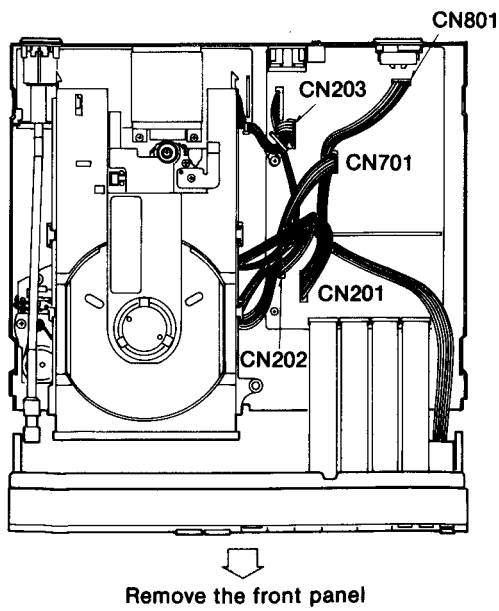


Caution for fitting
- The a ~ d of the disc tray should be set in grooves A ~ D of the drive rack.
- The e and f of the drive rack should be set in E and F of the disc holder.

Fitting of swing lever and spring
- Insert the spring into the pin, and fit the swing lever, matching part C of the swing lever with claw C.
- Match spring A to a and B to b.

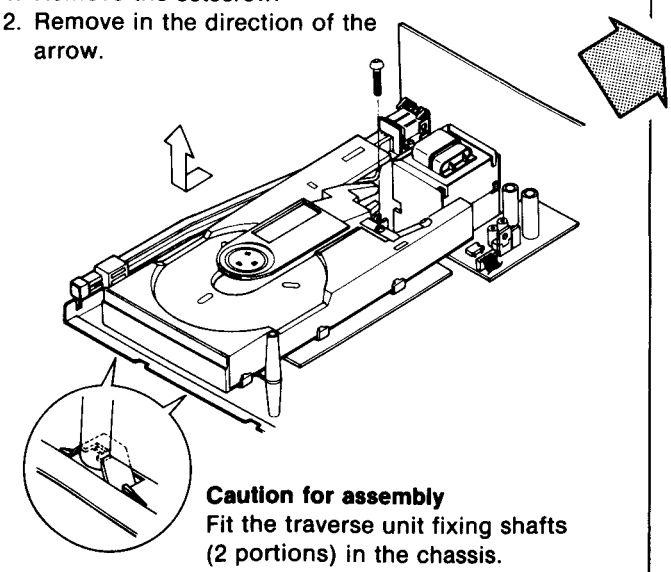
Ref. No. 9	How to remove the travers unit ass'y (Optical deck unit)
Procedure 1➡2➡9	• Remove the 5 connectors (CN201~ CN203, CN701, CN801).

Note: Locking the lock shaft at the bottom of the unit. (See page 4.)



Remove the front panel

1. Remove the setscrew.
2. Remove in the direction of the arrow.

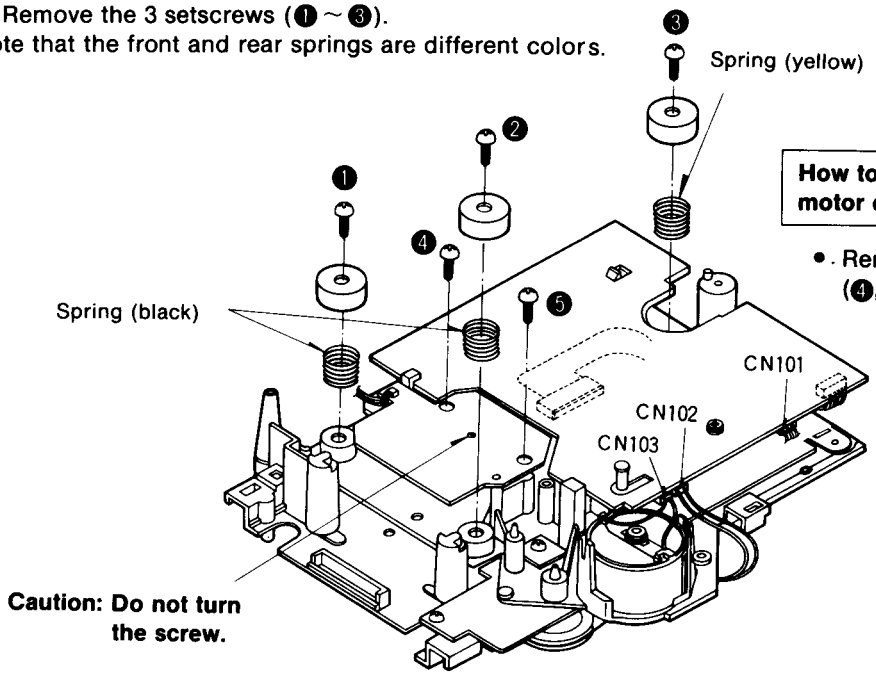


Caution for assembly
Fit the traverse unit fixing shafts (2 portions) in the chassis.

How to separate the traverse unit and disc holder

1. Turn over the traverse unit ass'y.
2. Pull out the 3 connectors (CN101 ~ CN103).
3. Remove the 3 setscrews (❶ ~ ❸).

Note that the front and rear springs are different colors.



How to remove the spindle motor drive P.C.B.

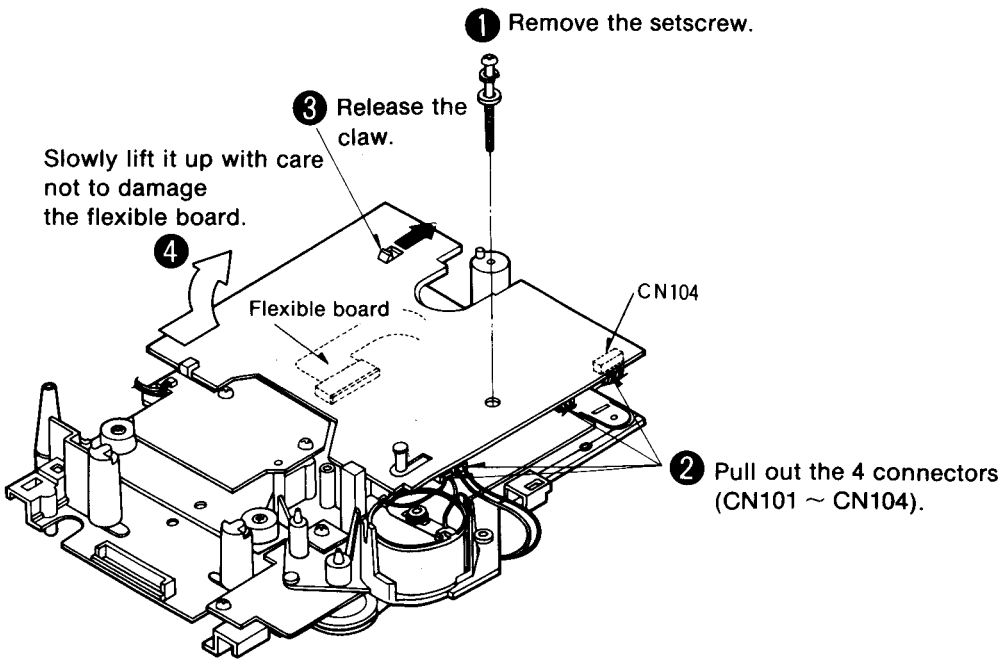
- Remove the 2 setscrews (❹, ❺).

Ref. No.	How to remove the optical servo P.C.B.
Procedure 9➡10	

Refer to the optical pickup handing precautions (see page 7).

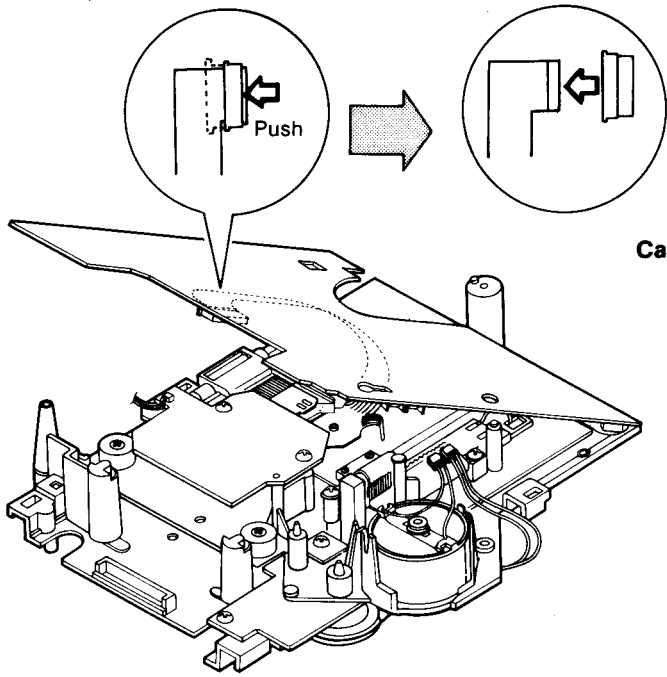
- Turn over the traverse unit ass'y and remove in the numerical order shown.

Cautons:
- When repairing with the optical servo P.C.B. opened, take special care not to cut off the flexible board of the optical pickup.
- When the flexible board is removed, insert the short pin into the board.


❶ Remove the setscrew.
❸ Release the claw.
Slowly lift it up with care not to damage the flexible board.
❹
Flexible board
CN104
❷ Pull out the 4 connectors (CN101 ~ CN104).

❺ Push the arrow-marked part of connector.

❻ Pull out the flexible board.



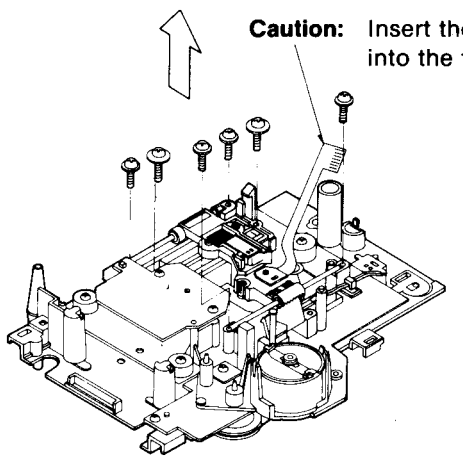
Caution: Insert the short pin into the flexible board in order to prevent breakdown of laser diode.

Refer to the optical pickup handling precautions (see page 7).

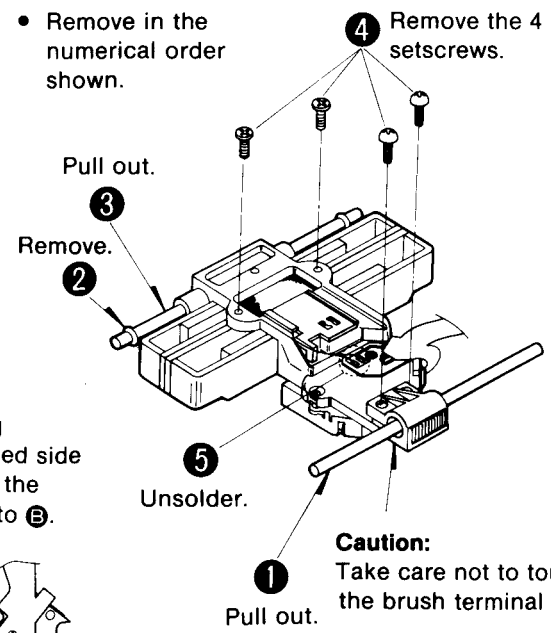
Ref. No. 11	**How to remove the optical pickup**
Procedure 9➡10➡11	• Remove the 6 setscrews.

Refer to the optical pickup handling precautions (see page 7).

Caution: Insert the short pin into the flexible board.



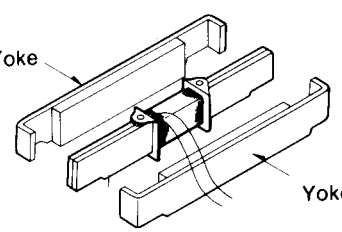
• Remove in the numerical order shown.



Caution: Take care not to touch the brush terminal here.

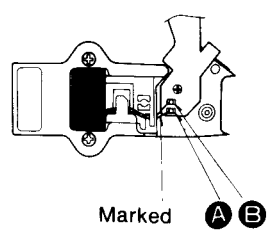
How to remove the drive coil

1. Remove the 2 yokes.
2. Pull out the drive coil.

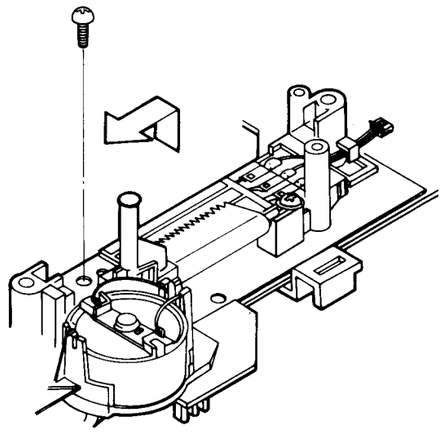


* DC resistance drive coil 36Ω±1.5Ω.

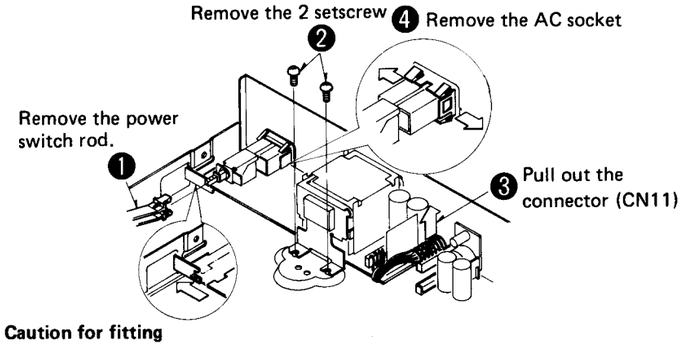
• **Drive coil fitting**
Solder the marked side of coil to Ⓐ and the unmarked side to Ⓑ.



Ref. No. 12	How to remove the resistance unit (Optical pickup speed detection)
Procedure 11➡12	1. Remove the setscrew. 2. Remove in the direction of the arrow.

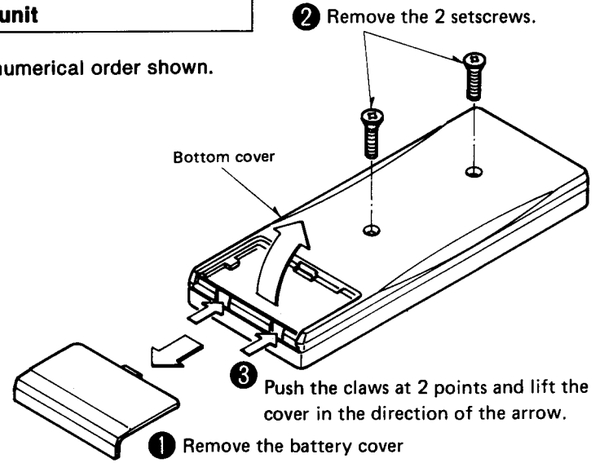


Ref. No. 13	How to remove the power supply P.C.B.
Procedure 13	• Remove in the numerical order shown.



Caution for fitting
Fit the P.C.B. in the groove of chassis.

Ref. No. 14	How to remove the bottom cover of remote control unit
Procedure 14	• Remove in the numerical order shown.


2 Remove the 2 setscrews.
Bottom cover
3 Push the claws at 2 points and lift the cover in the direction of the arrow.
1 Remove the battery cover

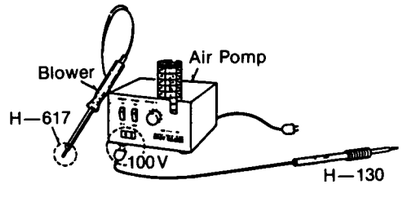
■ HOW TO REPLACE IC'S (Small outline type)

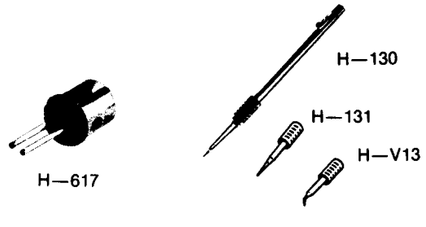
	Replacing procedure		Cautions
1	Reduce the amount of solder on each pin of the integrated circuit by use of a solder sucker.	(Example) H—130 Solder sucker	• Recommended tool .....Special soldering iron * H605M and H-130. * H605E and H-130. • Do not touch the soldering iron to the area for a long time. It may otherwise cause removal of the print foil. • When shifting the pin upward, do the job quickly while the solder is melting. If the solder is hard, it may cause removal or breakage of the print foil. • When using a pencil type soldering iron. 1. Completely remove the solder from each IC pin by use of solder sucker. 2. Raise each pin by means of an eyeleteer, hold the pliers then remove IC package from P.C.B.
2	Melt the solder on the pin (one electrode) with the soldering iron.		
3	While the solder is melting, shift the pin upward by the soldering iron to remove it from the foil.		
4	Remove each pin from the foil according to the above-mentioned procedure.		

*** Special soldering iron**
(Refer to Technical Information, ORDER NO. GAD84125486T1)...For U.S.A. and Canada
(Refer to Technical Information, ORDER NO. GAD84115476T8)...For others

• H—605 Spot Heater (hot-air solder iron)
This device that uses hot air to melt solder was developed to remove Flat-Pakage ICs, RHCs and chip parts.

- H—605M (For 120V power source)
- H—605E (For 200V/220V/240V power source)





• H—617 Twin Nozzle (for spot heater)
Special nozzle for the removal of RHCs and chip resistors. (Nozzle diameter: 1.0mm×2)

• H—130 Slim Pencil Solder Iron
An ultrasmall ceramic heater solder iron is extremely handy for soldering chip parts, RHCs, ICs etc., to high-density circuit boards.
Features:

• Rated power:	100V, 15W
• Max. temp.:	400℃
• Heater:	ceramic (long life)
• Insulation resistance:	100MΩ
• Length:	178mm
• Weight:	16g (not including cord)

• H—131, H—V13 Cap Bits
Solder tip for the slim pencil Solder Iron and is composed of a bit holder and a corrosion resistance solder tip.
Permits changing of solder tips even while still hot.

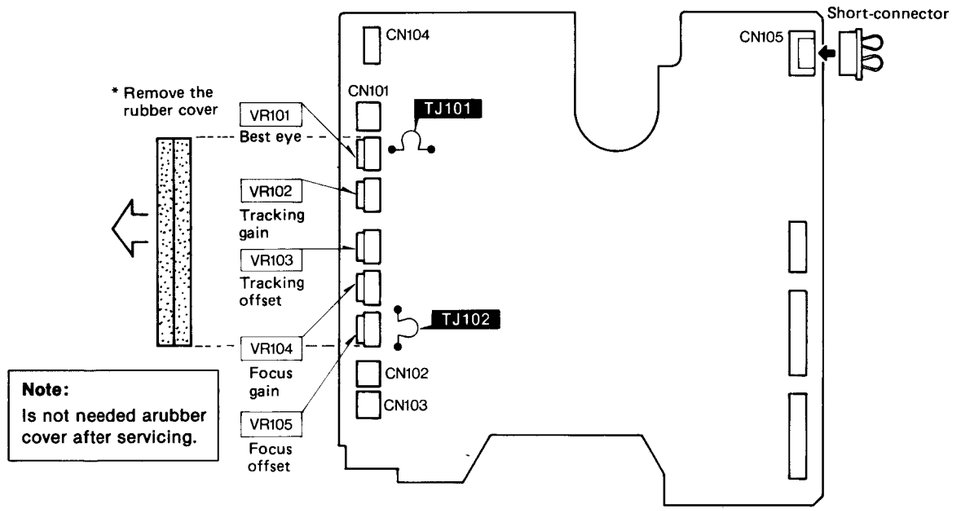
• Solder tip:	0.3mm

■ MEASUREMENTS AND ADJUSTMENTS

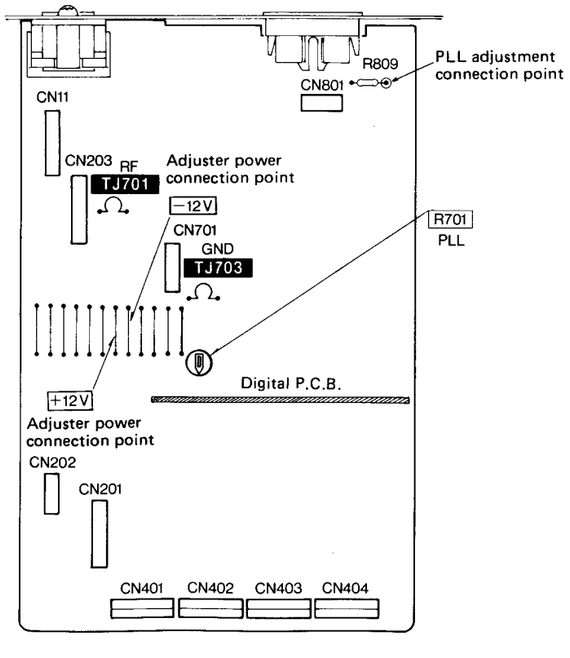
Caution:
- It is very dangerous to look at or touch the laser beam. (Laser radiation is invisible.) With the unit turned **"on"**, laser radiation is emitted from the pick-up lens. Be careful during adjustments in particular.
- The adjustment of this unit is basically the same as for SL-PJ11. (The adjusting points are partially different.) For the detail, refer to SL-PJ11 Service Manual (Order No. HAD8509261G0).

ADJUSTMENT POINTS

- **Servo P.C.B.**



- **Main P.C.B.**



ELECTRICAL ADJUSTMENT

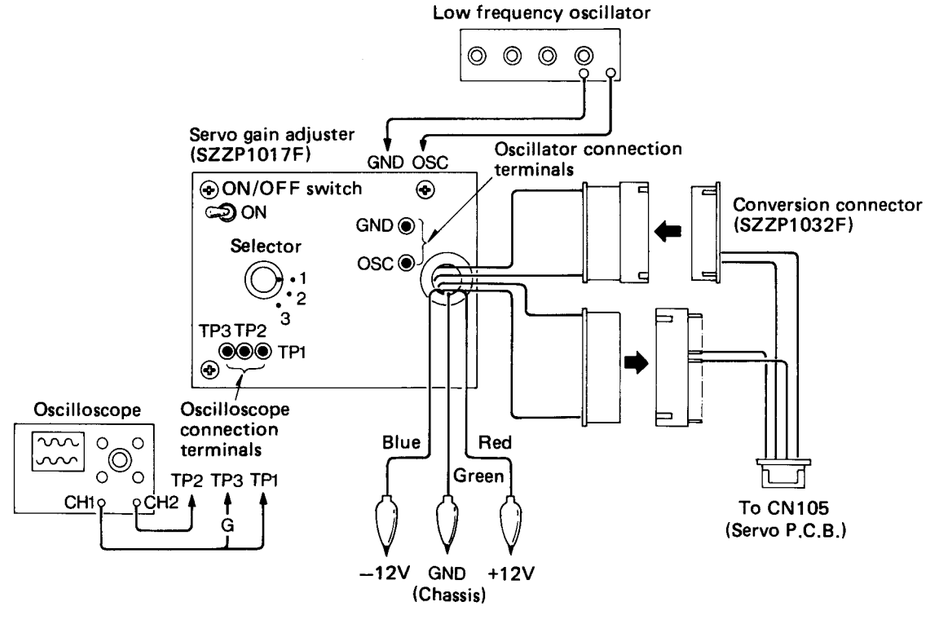
Equipment used

- Servo gain adjuster (SZZP1017F)
- Conversion connector (SZZP1032F)
- Two-channel oscilloscope (with trigger) of 30 MHz or over.
- Low frequency oscillator
- Test disc (SZZP1014F) . . . Refer to page 23
- Ordinary disc

Adjustment Procedure

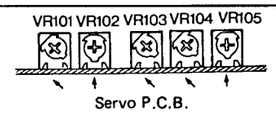
Step 1: Remove the cabinet. . . . . Page 8
▼
Step 2: Connect the servo gain adjuster. . . . . Page 18
▼
Step 3: Temporary setting of each VR. . . . . Page 19
▼
Step 4: Focus gain adjustment . . . . . Page 19
▼
Step 5: Tracking gain adjustment. . . . . Page 19
▼
Step 6: Best eye (PD balance) adjustment . . . . . Page 19
▼
Step 7: Focus offset adjustment . . . . . Page 20
▼
Step 8: Tracking offset adjustment . . . . . Page 20
▼
Step 9: PLL adjustment . . . . . Page 20
▼
Step 10: Check of operation after adjustment . . . . . Page 21

Servo Gain Adjuster and Its Connection



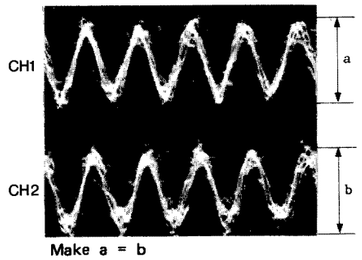
TEMPORARY SETTING OF EACH VR

1. Remove the rubber cover.
2. Temporarily set each VR of servo P.C.B. as shown.



FOCUS GAIN ADJUSTMENT

1. Adjust the low frequency oscillator to **750Hz** frequency and **150mVp-p** output voltage, and connect it to **OSC** and **GND** of servo gain adjuster.
2. Connect CH1 and CH2 of the oscilloscope to **TP1** and **TP2** of the servo gain adjuster. **(TP3 grounded)**
   Oscilloscope setting: VOLT..... 100mV (both channels)
   SWEEP..... 1msec.
   INPUT..... AC
3. Set the servo gain adjuster switch to "**2**". (Set the adjuster ON · OFF switch to "**ON**".)
4. Turn on the power switch and play the test disc.
5. With the adjuster switch shifted to "**3**", **750Hz** signal appears on the oscilloscope. So, adjust **VR104** so that the waveform amplitudes of both channels become equal to each other.

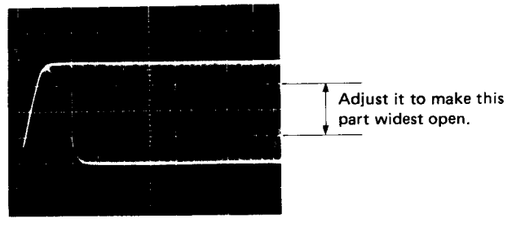


TRACKING GAIN ADJUSTMENT

1. Adjust the low frequency oscillator to **1.2kHz** frequency and **150mVp-p** output voltage.
2. Change the oscilloscope setting, making the oscilloscope connection the same as mentioned above.
   Oscilloscope setting: VOLT..... 100mV (both channels)
   SWEEP..... 0.5msec.
   INPUT..... DC
3. Set the servo gain adjuster switch to "**2**". (Set the adjuster ON · OFF switch to "**ON**".)
4. Turn on the power switch and play the test disc.
5. With the adjuster switch shifted to "**1**", **1.2kHz** signal appears on the oscilloscope. So, adjust **VR102** so that the waveform amplitudes of both channels become equal to each other.
6. The servo gain adjuster is not necessary for other adjustment. So, disconnect the adjuster, **and insert the short connector of CN105 to the original position.**

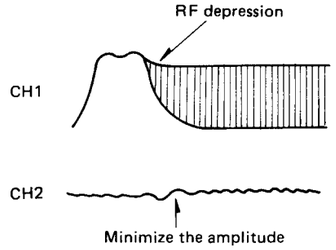
BEST EYE (PD BALANCE) ADJUSTMENT

1. Connect CH1 of the oscilloscope to **TJ701** (+) and **TJ703** (–) of the main P.C.B.
   Oscilloscope setting: VOLT.....200 mV
   SWEEP.....0.5 μsec.
   INPUT.....AC
2. Turn on the power switch and play the **track 13 or 8** (0.5mm black spot) of the test disc.
3. Adjust **VR101** so that the eye pattern of RF signal is widest open.



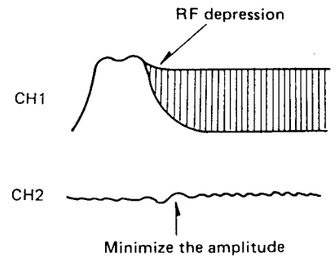
FOCUS OFFSET ADJUSTMENT

1. Connect CH1 of the oscilloscope to **TJ701** (+) and **TJ703** (–) to the main P.C.B. Connect CH2 to **TJ102** of servo P.C.B.
   Oscilloscope setting: VOLT..... 500 mV (CH1)
   100 mV (CH2)
   SWEEP..... 0.5msec.
   INPUT..... AC (CH1)
   DC (CH2)
   MODE..... NORM (Trigger on CH1)
2. Play the **track 13 or 8** (0.5mm black spot) of the test disc.
3. Trigger so that the waveform as shown appears on the oscilloscope, and adjust **VR105** to minimize the RF depression on CH1 and the wave amplitude on CH2.



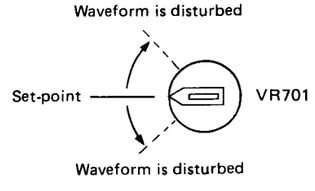
TRACKING OFFSET ADJUSTMENT

1. Connect CH1 of the oscilloscope to **TJ701** (+) and **TJ703** (–) to the main P.C.B. Connect CH2 to **TJ101** of servo P.C.B.
   Oscilloscope setting: VOLT..... 500 mV (CH1)
   100 mV (CH2)
   SWEEP..... 0.5msec.
   INPUT..... AC (CH1)
   DC (CH2)
   MODE..... NORM (Trigger on CH1)
2. Play the **track 13 or 8** (0.5mm black spot) of the test disc.
3. Trigger so that the waveform as shown appears on the oscilloscope, and adjust **VR103** to minimize the RF depression on CH1 and the wave amplitude on CH2.

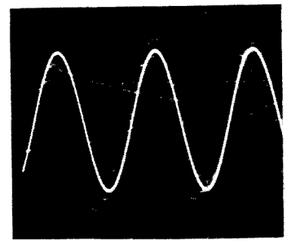


PLL ADJUSTMENT

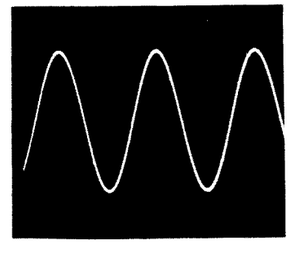
1. Connect CH1 of the oscilloscope to **R809** (+) and chassis (–) of the main P.C.B.
   Oscilloscope setting: VOLT..... 1V
   SWEEP..... 1 msec
   INPUT..... DC
2. Play the **track 13 or 8** (0.5mm black spot) of the test disc.
3. Adjust **VR701** while observing the oscilloscope and set it in the middle of the range where the waveform is stable.



• **NG**



• **OK**



CHECK OF PLAY OPERATION AFTER ADJUSTMENT

- **Skip search check**

1. Play a common disc.
2. Push the skip button to check the skip search. (Both in forward and reverse modes).

- **Manual search check**

1. Play a common disc.
2. Push the manual search button to check that manual search can be smoothly made at low and high speeds. (Both in forward and reverse modes).

- **Check for defect**

1. Play the **track 13 or 8** of the test disc to check that there is no sound skip or noise. (Black spot)
2. Play the **track 14 or 10** of the test disc to check that there is no sound skip or noise. (Fingerprint)

OPTICAL PICKUP ADJUSTMENT

Equipment used

- Two-channel oscilloscope (with trigger) of 30 MHz or over.
- Test disc (SZZP1014F)
- Hexagonal wrench (SZZP1044C)

Adjustment Procedure

* If the optical pickup is replaced, adjust it according to the following procedure.

Step 1: Assemble the set to make it ready for power supply. . . . . . Page 21

▼

Step 2: Temporary setting of each VR. . . . . . Page 22

▼

Step 3: Turntable height adjustment. . . . . . Page 22

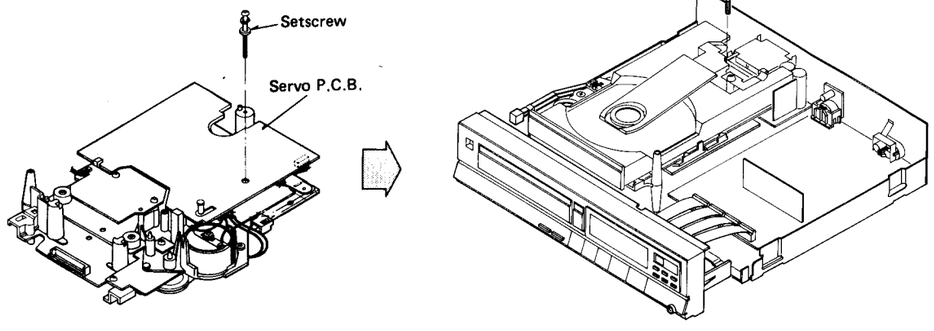
Step 4: Mechanical adjustment . . . . . Page 22

▼

Step 5: Electrical adjustment . . . . . Page 18

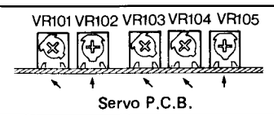
State of Setting

1. Before assembling the set, remove the setscrew of servo P.C.B.
2. Remove the loading base setscrew.
3. Pull out the front panel.



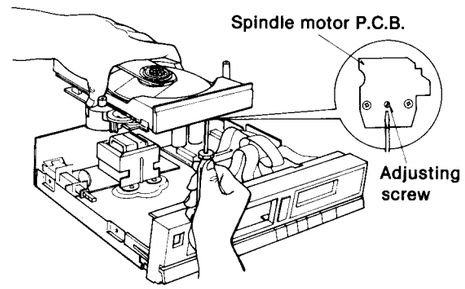
TEMPORARY SETTING OF EACH VR

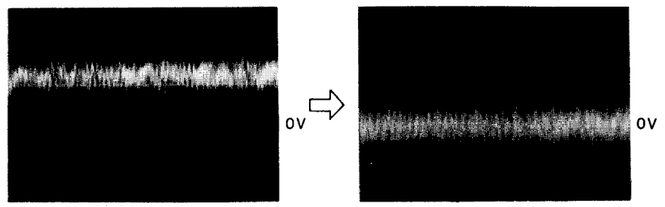
1. Remove the rubber cover.
2. Temporarily set each VR of the servo P.C.B. shown.



TURNTABLE HEIGHT ADJUSTMENT

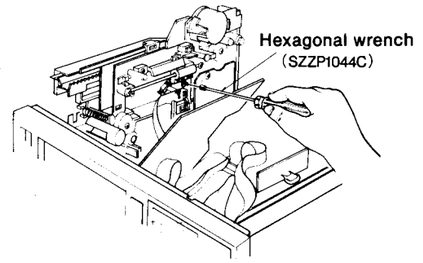
1. Connect the oscilloscope to **TJ102** (+) and chassis (–) of servo P.C.B.
   Oscilloscope setting: VOLT . . . . . 100 mV
   SWEEP . . . . . 5 msec.
   INPUT . . . . . DC
2. Turn **on** the power switch and mount the test disc.
3. Set the DC zero balance of oscilloscope.
4. Play the test disc.
5. Hold up the loading unit by hand during play.
   Caution: Hold the unit horizontally without giving it vibrations.
6. Turn the adjusting screw so that the voltage at the waveform center of the oscilloscope is **0V**.
   Caution: Do not turn the adjusting screw excessively.
7. After the adjustment, apply screw-lock bond to the adjusting screw.

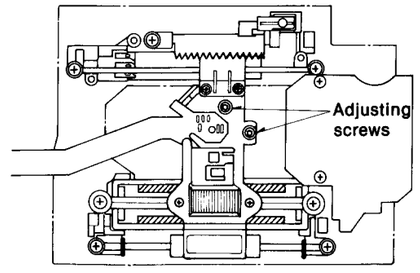


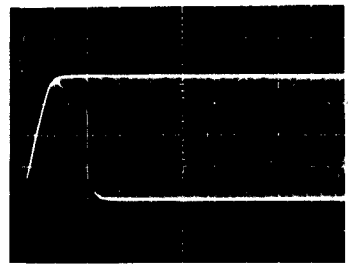


MECHANICAL ADJUSTMENT

1. Connect the oscilloscope to **TJ701** (+) and **TJ703** (–) of the main P.C.B.
   Oscilloscope setting: VOLT 200mV
   SWEEP . . . . . 0.5 μsec.
   INPUT . . . . . AC
2. Turn **on** the power switch and mount the test disc.
3. Play the test disc.
4. Set the unit as shown with care not to give vibrations to the loading unit.
5. Pull out the connectors (CN101 ~ 103) of the servo P.C.B.
6. Alternately turn the optical pickup adjusting screws (2 pcs) with hexagonal wrench (SZZP1044C) so that the eye pattern of the waveform (RF signal) of the oscilloscope is widest open.
   Cautions:
   1. Take care not to damage the flexible board of optical pickup during adjustment.
   2. Before installing the servo P.C.B., make sure that the condenser on the board is laid down.







ELECTRICAL ADJUSTMENT

1. Fit the loading unit to the chassis.
2. Follow the procedure of "**Electrical adjustment**" mentioned earlier.

■ ABOUT TEST DISC (SZZP1014F)

- Old and new types of test discs are available.
- The track No. and the contents of record are different between the old and new types.

※ For the detail, refer to separate table.

- Differences between old and new types.

Purpose	TR NO.	
	old	new
0.5mm Black spot	13	8
Finger print	14, 15	10

• Old type

TNO.	PURPOSE	SIGNAL	Time
		(TOC)	
1	Servo adjustment	Wowble Tone −10 dB L + R	2'00"
2	Pickup assenmety adjustment	Wawble Tone −10 dB L + R	5'00"
3	Reference	1 kHz 0 dB L + R	1'00"
4	Freq. Response	20 kHz 0 dB L + R	0'30"
5	Emphasis	16 kHz −0.96 L + R	0'30"
6	Channel Separation	L 1 kHz 0 dB R − ∞	0'30"
7	Channel Separation	R 1 kHz 0 dB L − ∞	0'30"
8	Dynamic range	1 kHz −60 dB L + R	1'00"
9	Linearity	1 kHz −80 dB L + R	1'00"
10	S/N	− ∞	2'00"
11	THD	1 kHz 0 dB L + R	1'00"
12	Black Spot	Wowble Tone −10 dB L + R	5'00"
13	Black Spot	Wowble Tone −10 dB L + R	5'00"
14	Finger Print	Wowbel Tone −10 dB L + R	5'00"
15	Finger Print	Wowble Tone −10 dB L + R	9'00"
16	Wedge	Wowble Tone −10 dB L + R	4'00"
17	Wedge	Wowble Tone −10 dB L + R	4'00"
18	Reference	1 kHz 0 dB L + R	0'30"

TNO.	PURPOSE	SIGNAL	Time
19	Freq. Response	15 Hz	0'30"
20	Freq. Response	20	0'30"
21	Freq. Response	50	0'30"
22	Freq. Response	100	0'30"
23	Freq. Response	200	0'30"
24	Freq. Response	500	0'30"
25	Freq. Response	2K	0'30"
26	Freq. Response	5K	0'30"
27	Freq. Response	10K	0'30"
28	Freq. Response	12K	0'30"
29	Freq. Response	15K	0'30"
30	Freq. Response	18K	0'30"
31	Freq. Response	20K	0'30"
32	Channel Separation	L 100 Hz 0 dB R − ∞	0'30"
33	Channel Separation	R 100 Hz 0 dB L − ∞	0'30"
34	Channel Separation	L 10 kHz 0 dB R − ∞	0'30"
35	Channel Separation	R 10 kHz 0 dB L − ∞	0'30"
36	Channel Separation	L 20 kHz 0 dB L − ∞	0'30"
37	Channel Separation	R 20 kHz 0 dB L − ∞	0'30"

• New type

TNO.	PURPOSE	SIGNAL	Time
1	Reference	1kHz 0dB L+R	1'40"
2	S/N	1kHz −∞ L+R	1'40"
3	Separation	1kHz 0dB L	1'40"
4	Separation	1kHz 0dB R	1'40"
5	Dynamic Range	1kHz −24dB L+R	1'40"
6	Emphasis	16kHz 0dB L+R	1'40"
7	Black Band 0.4mm	400Hz −10dB L+R	3'00"

TNO.	PURPOSE	SIGNAL	Time
8	Black Band 0.5mm	400Hz −10dB L+R	2'30"
9	Wedge 0.7mm	400Hz −10dB L+R	5'00"
10	Fingerprint No. 3	400Hz −10dB L+R	2'00"
11	Index check	INDEX 1 440Hz −10dB L+R INDEX 2 880Hz −10dB L+R INDEX 3 1760Hz −10dB L+R	8'00" 8'00" 1'00"
12	Repeat check	1kHz 0dB L+R	0'05"

■ REPLACEMENT PARTS LIST

Notes:
1. Part numbers are indicated on most mechanical parts. Please use this part number for parts order.
2. Important safety notice: Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
3. Bracketed indications in Ref. No. columns specify the area. Parts without these indication can be used for all areas.
4. The "S" mark is service standard parts and may differ from production parts.
5. The parenthesized numbers in the columns of description stand for the quantity per set.

Areas

[M].....U.S.A.
[MC]...Canada.
[E].....Switzerland and Scandinavia.
[EK]....United Kingdom.
[XL]....Australia.
[EG]...F.R. Germany.
[EB]....Belgium.
[EH]...Holland.
[EF]....France.
[Ei].....Italy.
[XA]....Southeast Asia, Oceania, Africa, Middle Near East and Central South America.
[PA]....East PX.
[PE]....European Military.
[PC]....European Audio Club.

Ref. No.		Part No.	Description
INTEGRATED CIRCUITS			
IC1		AN78M12	IC
IC2		AN79N12	IC
IC4, 5	⚠	SVIFU15	IC
IC11	⚠	AN78M05	IC
IC12	⚠	AN79N05	IC
IC101		AN8370S	IC
IC102		MN4053BS	IC
IC103, 104		AN6554NS	IC
IC201		AN6552	IC
IC202		AN6914	IC
IC301		AN8371S	IC
IC302		MN6617F	IC
IC303		MN4416S−12	IC
IC304		MN6618F	IC
IC401		MN15261PDC1	IC
IC402		MN1280−R	IC
IC501		AN8280LF	IC
IC601		MN1551PDD	IC
IC602 [M, MC]		SVIBX1327M	IC
IC602 [Other areas]		SVIBX1328E	IC
IC801		SVIAL075L	IC
IC802		SVIAL075R	IC
IC803		SVIPCM54KP	IC
IC804		SVILM833NA	IC
IC851		SVINJM4556S	IC
TRANSISTORS			
Q11		2SD973	Transistor
Q12		2SB793	Transistor
Q13		2SA1309	Transistor
Q101		2SC2021	Transistor
Q102	⚠	2SD1055	Transistor
Q103	⚠	2SB822	Transistor
Q104	⚠	2SD1055	Transistor
Q105	⚠	2SB822	Transistor
Q106	⚠	2SD1055	Transistor
Q107	⚠	2SB822	Transistor
Q108	⚠	2SD1055	Transistor
Q109, 110	⚠	2SB822	Transistor
Q111	⚠	2SC2021	Transistor
Q201		2SK301	FET
Q202		UN4212	Transistor

Ref. No.		Part No.	Description
TRANSISTORS			
Q203		2SA1309	Transistor
Q402, 403 Except for [M, MC]		UN4212	Transistor
Q404, 405 Except for [M, MC]		UN4112	Transistor
Q601~603		UN1212	Transistor
Q701		UN4212	Transistor
Q801		UN4112	Transistor
DIODES			
D1, 2	⚠	SVDS1WB40	Rectifier
D3	⚠	SVD1SR35200V	Rectifier
D11, 12		MA4082	Zener Diode
D13		MA4330	Zener Diode
D14		MA4082	Zener Diode
D101, 102		MA4056	Zener Diode
D401~403		MA165	Diode
D600~613, 615, 616		MA165	Diode
D701		MA4091	Zener Diode
D801, 802		MA4056	Zener Diode
D803		MA165	Diode
CRYSTAL			
X301		SVQ16CKSS	16.38MHz
VARIABLE RESISTORS			
VR101		EVND1AA00B53	Variable Resistor, 5kΩ(B)
VR102, 103		EVND1AA00B14	Variable Resistor, 10kΩ(B)
VR104		EVND1AA00B53	Variable Resistor, 5kΩ(B)
VR105		EVND1AA00B14	Variable Rresistor, 10kΩ(B)
VR701		EVN38CA00B13	Variable Resistor, 1kΩ(B)

Ref. No.		Part No.	Description
RELAY			
RLY801		SFDYG5A237P	Muting
SWITCHES			
S1	⚠	ESB823V	Power
S2 [XA, PA, PE, PC] only	⚠	SRDSHXW0251	Voltage Selector
S101		SRDSMLS−2	Close Det.
S102		SRDSMLS−3	Open Det.
S601, 602, 604~612, 616, 623, 624		EVQQS405K	Operation
POWER TRANSFORMER			
T1 [M]	⚠	SLT54JL14A	Power Source
T1 [MC]	⚠	SLT54JS27C	Power Source
T1 [EK, XL]	⚠	SLT54JE38E	Power Source
T1 [XA, PA, PE, PC]	⚠	SLT54JE40E	Power Source
T1 [Other areas]	⚠	SLT54JS39E	Power Source
COMPONENT COMBINATIONS			
Z601		EXBP811104K	100kΩ×11
C2, 3	⚠	EXRFS203ZS	0.01μF×2
FLUORESCENT DISPLAY TUBE			
FL601		SADD1	Display
HALL ELEMENT			
H501, 502		OH−003	Hall Element
FUSES			
F1 Except for [M, MC]	⚠	XBA2C012TB0S	250V, T125mA
F2 [XA, PA, PE, PC] only	⚠	XBA2C025TB0S	250V, T250mA

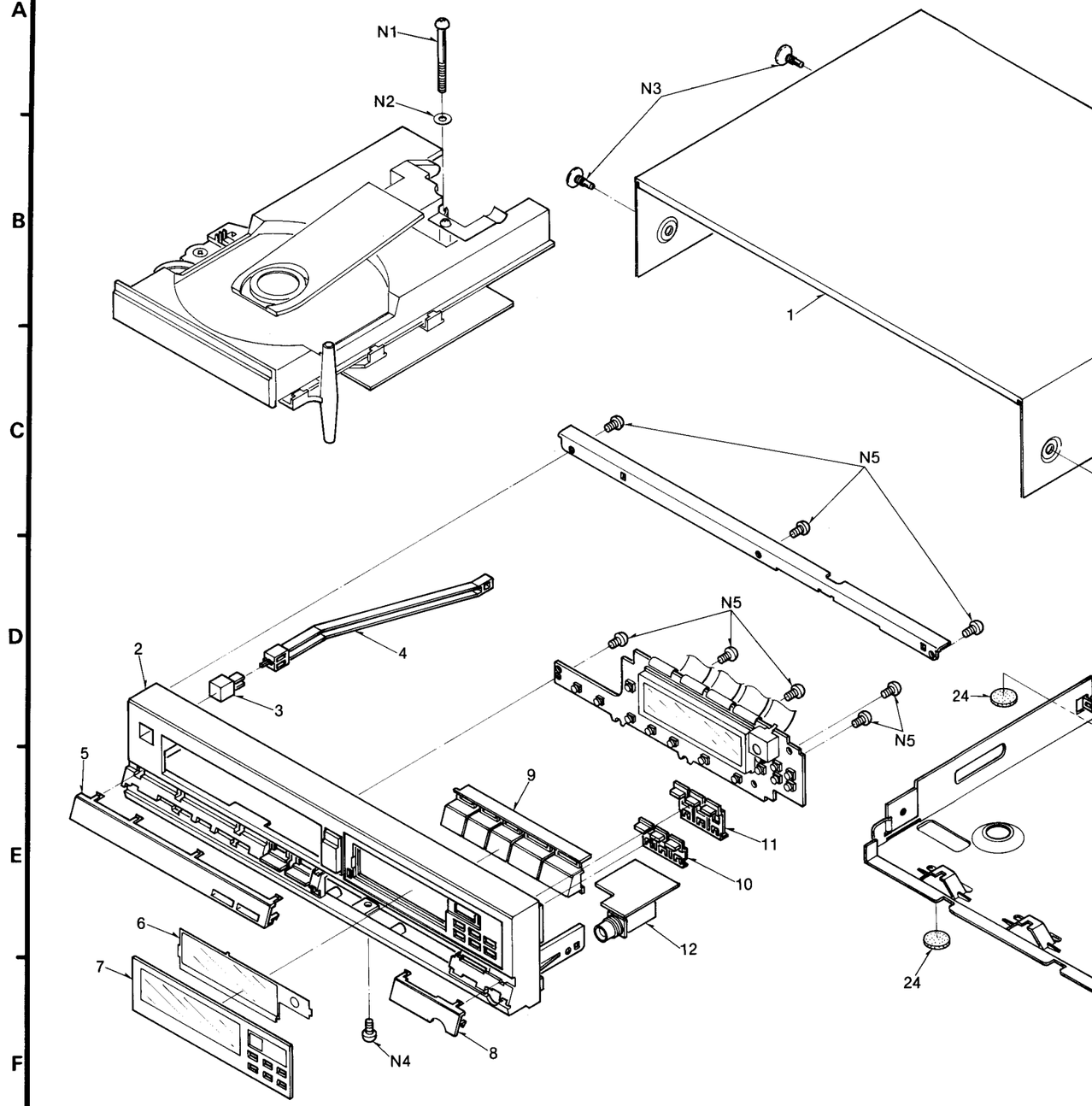
Ref. No.	Part No.	Description	
CABINET and CHASSIS PARTS			
1	SKCD1−1	Cabinet	(1)
2	SGYLPJ33−KM	Front Panel	(1)
3	SRKTJ02N02	Button	(1)
4	SUBD1	Rod	(1)
5	SGXD7−3	Ornament Plate	(1)
6	SDUD5	Filter	(1)
7	SGUD31−00A	Ornament Plate	(1)
8	SGXD30−1KA	Ornament Plate	(1)
9	SBCD13−1	Button	(1)
10	SBCD80	Button	(1)
11	SBCD70	Button	(1)
12	SRDJHLJ15401	Headphone Jack	(1)
13	SMCD2−1	Shield Plate	(1)
14 ⚠	SJVD0203B	AC Socket	(1)
15	SHGD25	Cushion Rubber	(1)
16	SMCD3−2	Shield Plate	(1)
17	SJS6805	Subcode Jack	(1)
18 Except for [M, MC]	SFDJD04N02	Jack	(1)
19	SRDJ007N06	Output Jack (L)	(1)
20	SRDJ007N05	Output Jack (R)	(1)
21 [XL]	SJVD0204A	Holder	(1)
21 [Other areas]	SJVD0203A	Holder	(1)
22	SJFD1	Holder	(1)
23 [XA, PA, PE, PC]	SGPD3−7	Chassis	(1)
23 [Other areas]	SGPD3−2	Chassis	(1)
24	SRGA008N01	Foot	(4)
25	SHE185	Spacer	(3)
26 [M]	SGTD49	Name Plate	(1)
26 [MC]	SGTD50	Name Plate	(1)
26 [E]	SGTD51	Name Plate	(1)
26 [EK]	SGTD52	Name Plate	(1)
26 [XL]	SGTD53	Name Plate	(1)
26 [EG]	SGTD54	Name Plate	(1)
26 [PA, PE, PC]	SGTD56	Name Plate	(1)
26 [Other areas]	SGTD55	Name Plate	(1)
27 [M, MC] only	SGKD50	Label	(1)
TRAVERSE DECK PARTS			
31	SIRD1−1	Case	(1)
32	SGXD9E−1	Ornament Plate	(1)
32-1	SGBD2−1	Badge	(1)
33	SUSD10	Spring	(1)
34	SIRD3	Lever	(1)
35	SIWD3E	Tray Ass'y	(1)
35-1	SHGD7−2	Rubber	(3)
35-2	SIRD4	Spacer	(4)
35-3	SHGD19	Rubber	(1)
36	SISD3	Drive Rack	(1)
37	SRGB007N02	Belt	(1)
38	SDGD10	Gear	(1)
39	SDGD11	Gear	(1)
40	SDGD12	Gear	(1)
41	SHGD5	Rubber	(2)
42	SISD2E	Bracket	(1)
43	SJGD2R	Motor Ass'y	(1)
44	SISD1	Loading Base	(1)

Ref. No.	Part No.	Description	
TRAVERSE DECK PARTS			
45	SHGD11	Rubber	(1)
46	SHGD24	Rubber	(1)
47	SHGD20	Rubber	(1)
48	SUSD16	Spring	(1)
49	SIRD5	Disc Clamper	(1)
50	SIRD6	Holder	(1)
51	SOMD4	Magnet	(1)
52	SOYD2	Yoke	(1)
53	SHGD8	Rubber	(1)
54	SUSD11	Spring	(1)
55	SIRD2	Lever	(1)
56	SUSD9	Spring	(1)
57	SDMD2A	Rotor Ass'y	(1)
58	SUXD15	Shaft	(2)
59	SHGD10	Rubber	(2)
60	EWSL03	Holder	(1)
61	SISD4E	Traverse Base	(1)
62 ⚠	SOAD20A	Optical Pick-up Ass'y	(1)
63	SORD7	Cover	(1)
64	SORD5E	Coil	(1)
65	SOYD3E	Yoke (A)	(2)
66	SOYD4	Yoke (B)	(2)
67	SDGD13	Gear	(1)
68	EWS7AKA00Q53	Resistance Unit	(1)
69	SHRD4	Lock Unit	(1)
70	SDOD8	Ring	(1)
71	SRQA010N04	Spring	(1)
72	SDOD7−1	Turntable Ass'y	(1)
73	SHRD3	Holder	(3)
74	SUSD12	Spring (A)	(2)
75	SHGD9	Rubber	(3)
76	SUSD13	Spring (B)	(1)
77	SXPD220−1	Spindle P.C.B. Ass'y	(1)
78	SRDJ001N14E	Connector Ass'y	(1)
79	SHGD6	Rubber	(2)
CONNECTORS			
81	EMCS0250ZL	Connector (White), CN103	(1)
81	EMCS0250ZLB	Connector (Blue), CN101	(1)
81	EMCS0250ZLR	Connector (Red), CN102	(1)
82	EMCS0350Z	Connector (White), CN104	(1)
82	EMCS0550Z	Connector (White), CN202, 801	(2)
82	EMCS0650Z	Connector (White), CN701	(1)
82	EMCS0950Z	Connector (White), CN11	(1)
82	EMCS0950ZMB	Connector (Blue), CN201	(1)
82	EMCS0950ZMR	Connector (Red), CN203	(1)
83	SJSD0905	Connector, CN401~404	(4)
84	SJS1703	Connector, CN106	(1)
85	EMCS0551ML	Connector, CN105	(1)
SCREWS and WASHERS			
N1	XTN3+40JFYR	Screw, ⊕3×40	(1)
N2	XWE3D8	Washer, φ3	(1)
N3	SRXG007N51	Screw	(4)
N4	XTV3+6JFZ	Screw, ⊕3×6	(1)

Ref. No.	Part No.	Description	
SCREWS and WASHERS			
N5	XTV3+8G	Screw, ⊕3×8	(12)
N6	XTV3+6JFYR	Screw, ⊕3×6	(2)
N7	XTV3+14JFYR	Screw, ⊕3×14	(3)
N8	XTV3+8GFZ	Screw, ⊕3×8	(1)
N9	XTW3+8Q	Screw, ⊕3×8	(1)
N10	SFXGB20−01	Screw	(2)
N11	XXE26D5	Screw, 2.6×5	(1)
N12	XTV3+10G	Screw, ⊕3×10	(3)
N13	SFXGQ06N01	Screw	(2)
N14	XTV3+6J	Screw, ⊕3×6	(1)
N15	XTW3+8T	Screw, ⊕3×8	(1)
N16	XYN26+C4	Screw, ⊕2.6×4	(2)
N17	XYN26+W8	Screw, ⊕2.6×8	(2)
N18	SNSD10	Screw	(4)
N19	SRXW007N02	Washer	(1)
N20	SNSD9	Screw	(1)
N21	SRXG007N11	Screw	(1)
N22	XTV3+8J	Screw, ⊕3×8	(1)
PACKING PARTS			
P1 [MC, EF]	SPND34	Carton Box	(1)
P1 [Other areas]	SPND33	Carton Box	(1)
P2	SPSD3	Pad, Front	(1)
P3	SPSD4	Pad, Rear	(1)
P4	XZB45X40A01	Polyethylene Bag, Unit	(1)
P5	SRHZJ02N01	Polyethylene Bag, Remote Control Unit	(1)
P6	SFYF23A35	Polyethylene Bag, Accessories	(1)
ACCESSORIES			
A1 [M]	SQUD56	Instruction Book	(1)
A1 [MC]	SQUD57R	Instruction Book	(1)
A1 [EK]	SQUD59	Instruction Book	(1)
A1 [EI]	SQUD60	Instruction Book	(1)
A1 [E, EB, EH]	SQUD62R	Instruction Book	(1)
A1 [PA, PE, PC]	LPJ33−KPA	Instruction Book	(1)
A1 [Other areas]	SQUD58	Instruction Book	(1)
A2 ⚠ [M, MC]	SJA170	AC Cord	(1)
A2 [XL] ⚠	SJA173	AC Cord	(1)
A2 [EK] ⚠	SFDAC05G02	AC Cord	(1)
A2 ⚠ [PA, PE, PC]	SJA168−1	AC Cord	(1)
A2 ⚠ [Other areas]	SJA171	AC Cord	(1)
A3	SRDH001N01	Output Cord	(1)
A4 ⚠ [PA, PE, PC only]	SJP9215	Adaptor	(1)
A5 ⚠ [XA] only	SFDKI19118	2 Pin Plug	(1)
A6	UN−3N	Battery	(2)

■ EXPLODED VIEWS

• **Cabinet and chassis parts**



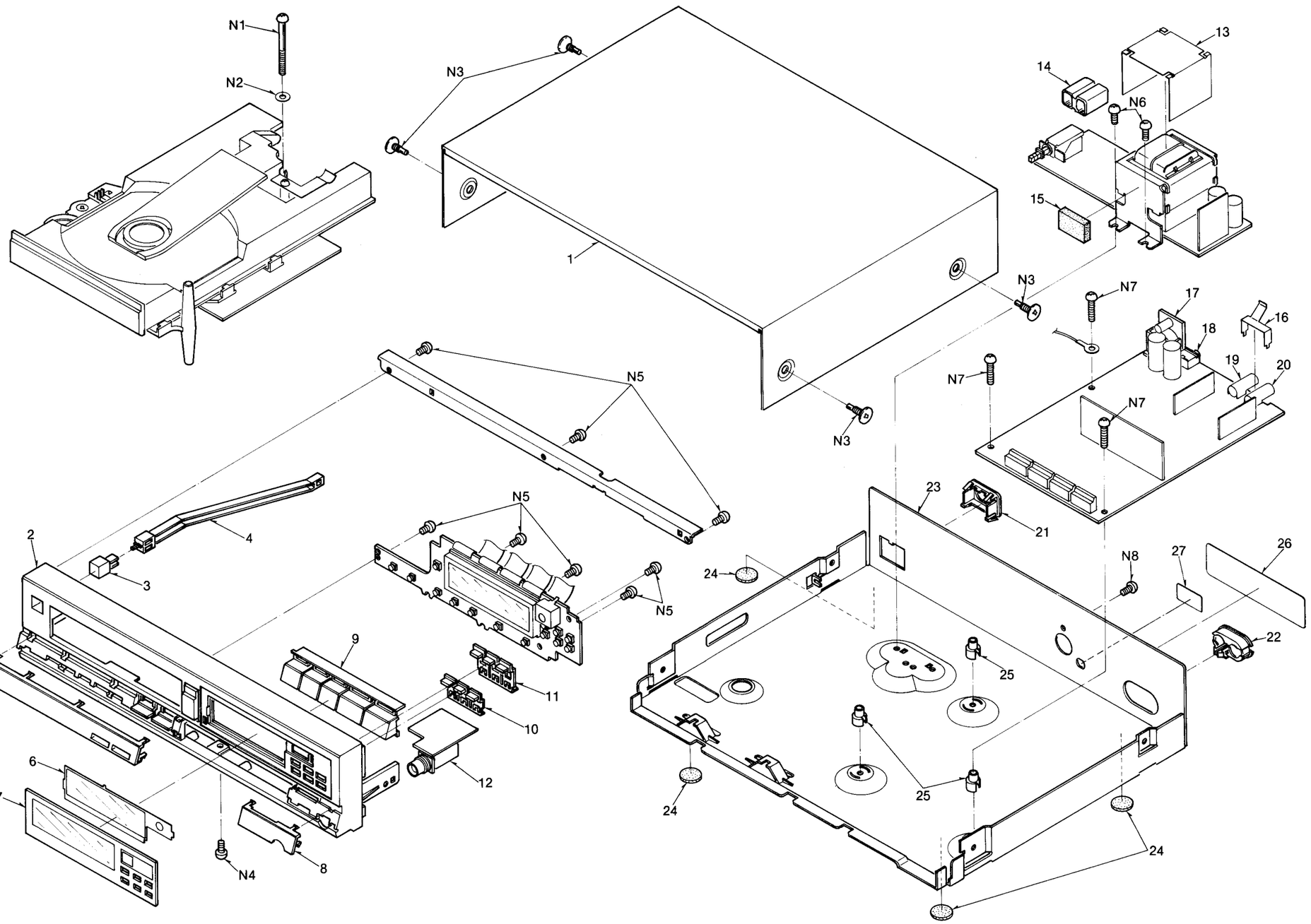
	Description	
RS		
	Screw, ⊕3×8	(12)
	Screw, ⊕3×6	(2)
R	Screw, ⊕3×14	(3)
	Screw, ⊕3×8	(1)
	Screw, ⊕3×8	(1)
	Screw	(2)
	Screw, 2.6×5	(1)
	Screw, ⊕3×10	(3)
	Screw	(2)
	Screw, ⊕3×6	(1)
	Screw, ⊕3×8	(1)
	Screw, ⊕2.6×4	(2)
	Screw, ⊕2.6×8	(2)
	Screw	(4)
	Washer	(1)
	Screw	(1)
	Screw	(1)
	Screw, ⊕3×8	(1)
	Carton Box	(1)
	Carton Box	(1)
	Pad, Front	(1)
	Pad, Rear	(1)
	Polyethylene Bag, Unit	(1)
	Polyethylene Bag, Remote Control Unit	(1)
	Polyethylene Bag, Accessories	(1)
	Instruction Book	(1)
	Instruction Book	(1)
	Instruction Book	(1)
	Instruction Book	(1)
	Instruction Book	(1)
	Instruction Book	(1)
	Instruction Book	(1)
	AC Cord	(1)
	AC Cord	(1)
	AC Cord	(1)
	AC Cord	(1)
	AC Cord	(1)
	Output Cord	(1)
	Adaptor	(1)
	2 Pin Plug	(1)
	Battery	(2)

■ EXPLODED VIEWS

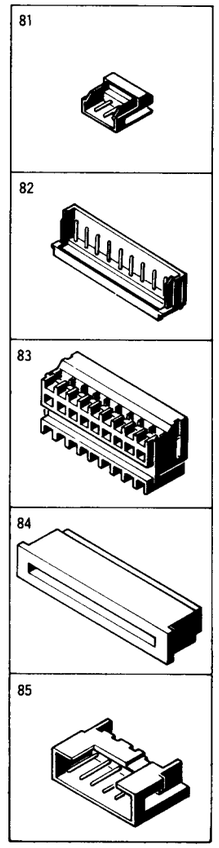
1 2 3 4 5 6 7 8 9

A B C D E F

• Cabinet and chassis parts



• Connectors

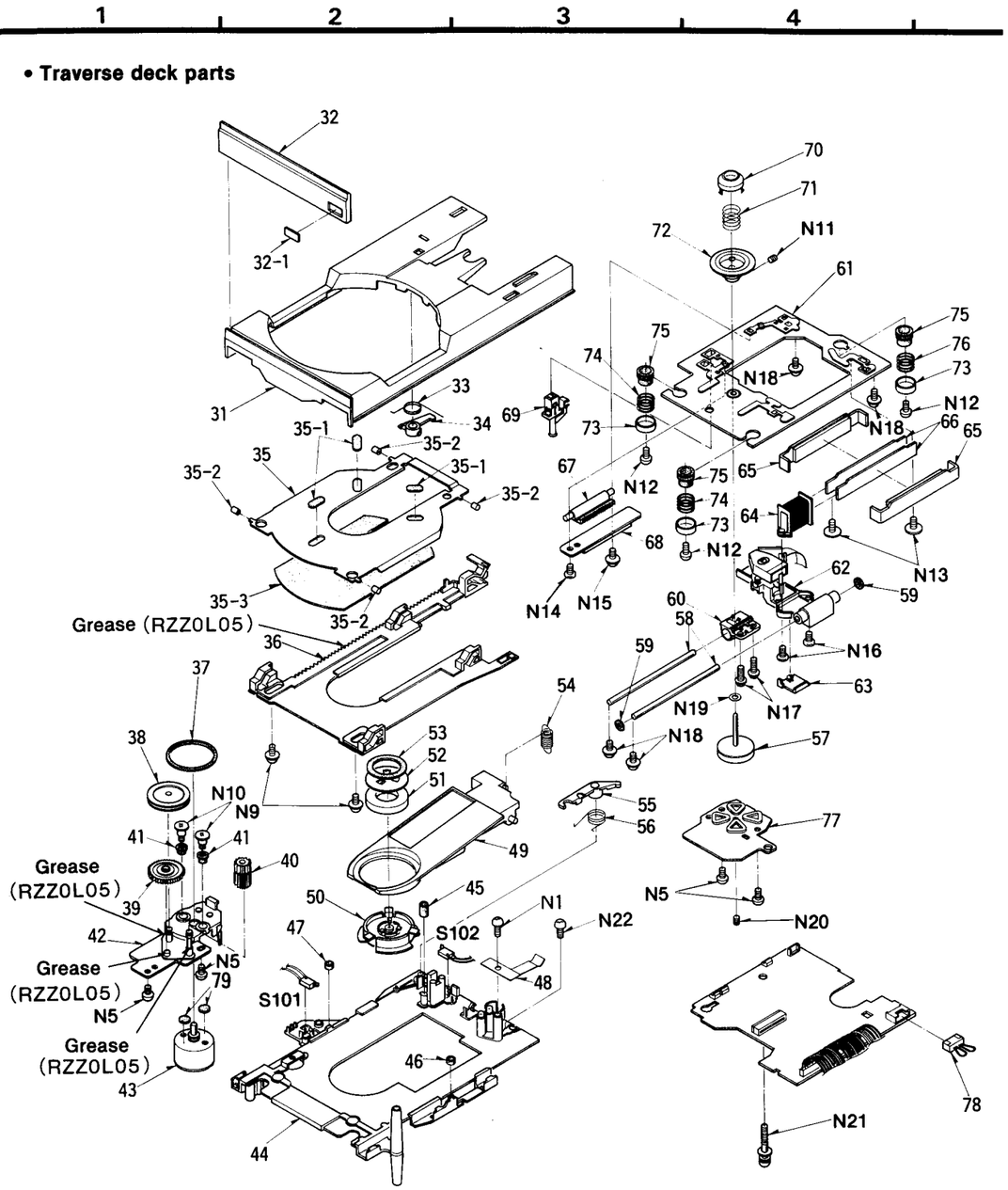


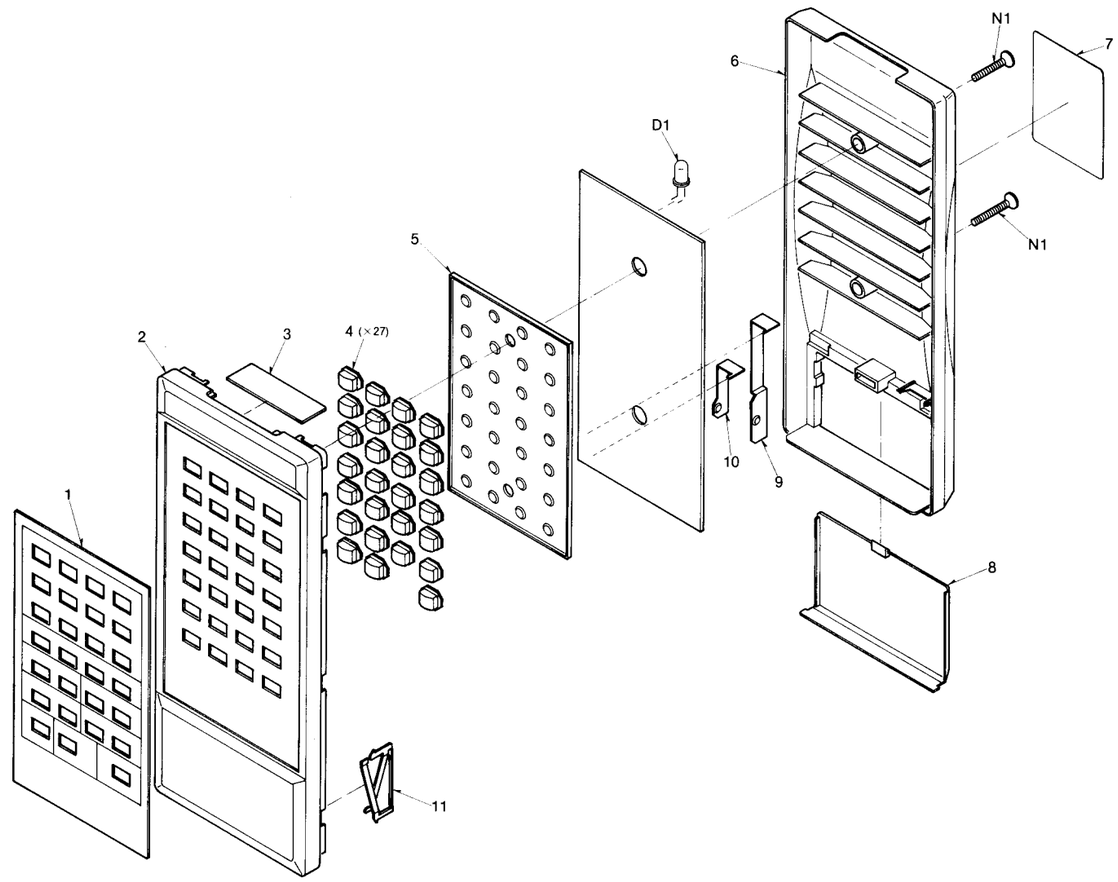
■ REPLACEMENT PARTS LIST AND EXPLODED VIEW
(Remote Control Unit)

• REMOTE CONTROL UNIT

Ref. No.	Part No.	Description
IC		
IC1 [M, MC]	MN6030CA	IC
IC1 [Other areas]	MN6030B	IC
TRANSISTOR		
Q1	UN1231	Transistor
DIODES		
D1	LN66S	LED
D4, 5	MA154WK	Diode
D6, 7	MA154WA	Diode
CERAMIC OSCILLATOR		
X1 [M, MC]	CSB455EB1T	455kHz
X1 [Other areas]	CSB420PB1	420kHz

Ref. No.	Part No.	Description	
CABINET and CHASSIS PARTS			
1	UR64PP124B	Panel	(1)
2	UR64CS119	Top Cover	(1)
3	UR64SB125	Cover	(1)
4	UR64BT123A	Button	(27)
5	UR64CT122	Spacer	(1)
6	UR64CS120	Bottom Cover	(1)
7	UR64LB126AB	Label	(1)
8	UR64EC121	Battery Cover	(1)
9	UR64TD128	Terminal ⊖	(1)
10	UR64TD127	Terminal ⊕	(1)
11	UR52TD101	Terminal	(1)
SCREW			
N1	XTS26+12GFZ	Screw, ⊕2.6×12	(2)





■ RESISTORS A

Notes: 1. Part numbers
Please use this
2. Important saf
Components i
important for
use only manu

Numbering System

Example

ERD	S2
Type	Wattage (1/4W)

ERJ	8	GI
Type	Wattage (1/8W)	Sh

Resistor Type	
ERD	: Carbon
ERJ	: Chip Type Carbon
ERO	: Metal Film

- **Indication of RCBS**
- **Rated voltage**

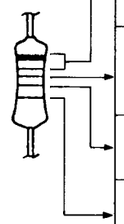
The rated voltages are in

Rated voltage (DC)
16V
50V

- **Electrostatic capacity**

The nominal electrostati

Colo
1st, 2nd col (Effective n electrostati
3rd color ba (Multiplier electrostatic
4th color ba (Tolerances
5th color ba (Temperatu

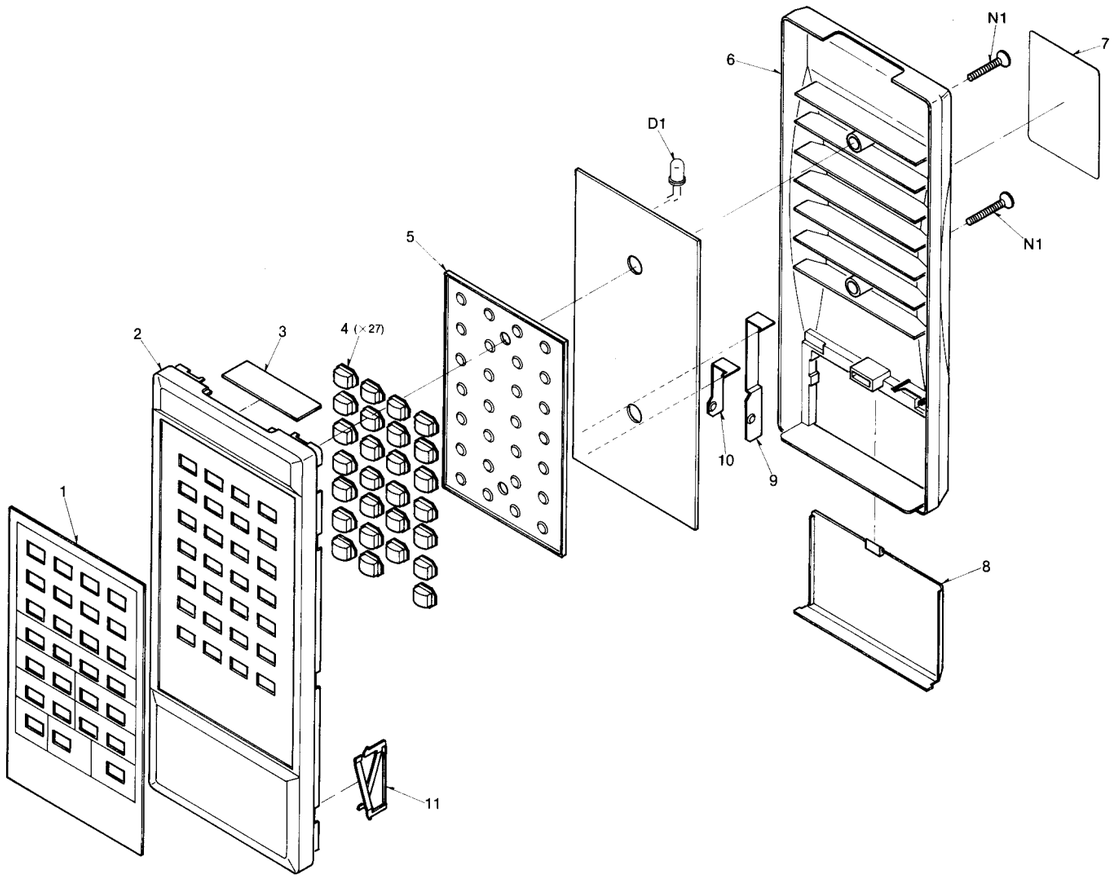


■ REPLACEMENT PARTS LIST AND EXPLODED VIEW
(Remote Control Unit)

● REMOTE CONTROL UNIT

Ref. No.	Part No.	Description
IC		
IC1 [M, MC]	MN6030CA	IC
IC1 [Other areas]	MN6030B	IC
TRANSISTOR		
Q1	UN1231	Transistor
DIODES		
D1	LN66S	LED
D4, 5	MA154WK	Diode
D6, 7	MA154WA	Diode
CERAMIC OSCILLATOR		
X1 [M, MC]	CSB455EB1T	455kHz
X1 [Other areas]	CSB420PB1	420kHz

Ref. No.	Part No.	Description	
CABINET and CHASSIS PARTS			
1	UR64PP124B	Panel	(1)
2	UR64CS119	Top Cover	(1)
3	UR64SB125	Cover	(1)
4	UR64BT123A	Button	(27)
5	UR64CT122	Spacer	(1)
6	UR64CS120	Bottom Cover	(1)
7	UR64LB126AB	Label	(1)
8	UR64EC121	Battery Cover	(1)
9	UR64TD128	Terminal ⊖	(1)
10	UR64TD127	Terminal ⊕	(1)
11	UR52TD101	Terminal	(1)
SCREW			
N1	XTS26+12GFZ	Screw, ⊕2.6×12	(2)



■ RESISTORS AND CAPACITORS

Notes: 1. Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
2. Important safety notice: Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
3. The " S " mark is service standard parts and may differ from production parts.
4. Unless otherwise specified. All resistors are in OHMS (Ω) K = 1000Ω, M = 1000kΩ. All capacitors are in MICORFARADS (μF), P = 10^{-6}μF.

Numbering System of Resistor

Example

ERD	S2	T	J	101
Type	Wattage (1/4W)	Shap	Tolerance (± 5%)	Value (1kΩ)

ERJ	8	GEY	J	102	⬚
Type	Wattage (1/8W)	Shape	Tolerance (± 5%)	Value (1kΩ)	Specialuse

Resistor Type	Wattage	Tolerance
ERD : Carbon ERJ : Chip Type Carbon ERO : Metal Film	S2 : 1/4W 8 : 1/8W	J : ± 5% K : ± 10%

Numbering System of Capacitor

Example

ECKD	1H	102	K	C
Type	Voltage (50V)	Value (0.001μF)	Tolerance (± 10%)	Peculiarity

ECEA	0G	KS	470	L
Type	Voltage (4V DC)	Peculiarity use	Value (47μF)	Special use

GR426	B	273	K	25
Type	Peculiarity	Value (0.027μF)	Tolerance (± 10%)	Voltage (25V)

Type	Voltage	Tolerance
ECEA, AR, REC : Electrolytic	**ECEA, AR, REC, ECEV Types** 0G : 4V 0J : 6.3V 1A : 10V 1C : 16V 1E : 25V 1V : 35V 1H : 50V	F : ± 1 pF J : ± 5% K : ± 10% M : ± 20% Z : +80 −20% N : ± 30% P : +100 −0%
ECEA..N, ARA...N : Non-Polar Electrolytic		
ECEV...N : Non-Polar Electrolytic (Chip Type)		
ECQV : TF ECQM : Polyester	**Others** 1E : 25V DC 1H : 50V DC 50 : 50V DC 2B : 125V DC KC : 125V AC	
ECFR, ECKD, ECFF, ECKR : Ceramic		
RCBS : Ceramic (Axial Type)		

- **Indication of RCBS type capacitor (Axial type)**
- **Rated voltage**

The rated voltages are indicated by insulating paint colors.

Rated voltage (DC)	Paint color
16V	Pink
50V	Light-green

- **Electrostatic capacity and characteristics**

The nominal electrostatic capacites (PF), tolerances and temperature characteristics are indicated by color codes.

Color band	Brown	Red	Orange	Yellow	Green	Blue	Purple	Gray	White	Black	Gold	Silver
1st, 2nd color bands (Effective number of nominal electrostatic capacity)	1	2	3	4	5	6	7	8	9	0	—	—
3rd color band (Multiplier of nominal electrostatic capacity)	10^1	10^2	10^3	10^4	—	—	—	—	—	10^0	10^{-1}	10^{-2}
4th color band (Tolerances)	—	—	—	—	—	—	—	N	Z	M	J	K
5th color band (Temperature characteristic)												

● RESISTORS

Ref. No.	Part No.	Value
R11, 12	ERDS2TJ102	1K
R13	ERDS2TJ222	2.2K
R14	ERDS2TJ822	8.2K
R15	ERDS2TJ100	10
R101, 102	ERDS2TJ821	820
R103	ERDS2TJ154	150K
R104, 105	ERDS2TJ104	100K
R106	ERDS2TJ154	150K
R107	ERDS2TJ101	100
R108	ERDS2TJ474	470K
R109	ERDS2TJ222	2.2K
R110	ERDS2TJ564	560K
R111	ERDS2TJ472	4.7K
R112	ERDS2TJ683	68K
R113	ERDS2TJ104	100K
R114	ERDS2TJ474	470K
R115	ERDS2TJ101	100
R116	ERDS2TJ332	3.3K
R117	ERDS2TJ564	560K
R119	ERDS2TJ222	2.2K
R120	ERDS2TJ101	100
R121	ERDS2TJ392	3.9K
R122	ERDS2TJ270	27
R123	ERDS2TJ3R3	3.3
R124	ERDS2TJ224	220K
R125	ERDS2TJ333	33K
R126	ERDS2TJ182	1.8K
R127	ERDS2TJ333	33K
R128	ERDS2TJ122	1.2K

Ref. No.	Part No.	Value
R129	ERDS2TJ103	10K
R131	ERDS2TJ472	4.7K
R132	ERDS2TJ103	10K
R133	ERDS2TJ153	15K
R134	ERDS2TJ101	100
R135	ERDS2TJ270	27
R136	ERDS2TJ3R3	3.3
R137	ERDS2TJ272	2.7K
R138, 139	ERDS2TJ333	33K
R140	ERDS2TJ122	1.2K
R141	ERDS2TJ153	15K
R142	ERDS2TJ272	2.7K
R143	ERDS2TJ683	68K
R144	ERDS2TJ473	47K
R145	ERDS2TJ154	150K
R146, 147	ERDS2TJ222	2.2K
R148	ERDS2TJ223	22K
R149	ERDS2TJ334	330K
R150	ERDS2TJ822	8.2K
R151, 152	ERDS2TJ682	6.8K
R153	ERDS2TJ822	8.2K
R154, 155	ERDS2TJ222	2.2K
R156, 157	ERDS2TJ102	1K
R158	ERDS2TJ471	470
R159	ERDS2TJ120	12
R160	ERDS2TJ153	15K
R161	ERDS2TJ272	2.7K
R162	ERDS2TJ102	1K
R163	ERDS2TJ104	100K

Ref. No.	Part No.	Value
R201	ERDS2TJ223	22K
R202	ERDS2TJ473	47K
R203	ERDS2TJ223	22K
R204~208	ERDS2TJ473	47K
R209	ERDS2TJ682	6.8K
R210	ERDS2TJ224	220K
R211	ERDS2TJ223	22K
R212	ERDS2TJ101	100
R213	ERDS2TJ392	3.9K
R214	ERDS2TJ101	100
R215	ERDS2TJ392	3.9K
R216, 217	ERDS2TJ222	2.2K
R218	ERDS2TJ473	47K
R301	ERDS2TJ224	220K
R302	ERDS2TJ333	33K
R303	ERDS2TJ221	220
R304	ERDS2TJ562	5.6K
R305	ERDS2TJ474	470K
R401~407	ERDS2TJ472	4.7K
R408~413	ERDS2TJ103	10K
R414	ERDS2TJ394	390K
R415	ERDS2TJ472	4.7K
R501	ERJ8GEYJ1R5V	1.5
R502	ERJ8GEYJ223V	22K
R503, 504	ERJ8GEYJ560V	56
R505	ERJ8GEYJ473V	47K
R701	ERDS2TJ154	150K
R702	ERDS2TJ224	220K
R703, 704	ERDS2TJ102	1K

Ref. No.	Part No.	Value
R705	ERDS2TJ123	12K
R706	ERDS2TJ103	10K
R707	ERDS2TJ472	4.7K
R708	ERDS2TJ561	560
R709	ERDS2TJ102	1K
R710	ERDS2TJ152	1.5K
R801, 802	ERDS2TJ222	2.2K
R803	EROS2CKG1101	1.1K
R804	EROS2TKG1101	1.1K
R805, 806	EROS2TKG1201	1.2K
R807	ERDS2TJ391	390
R808	ERDS2TJ104	100K
R809	ERDS2TJ391	390
R810	ERDS2TJ104	100K
R851	ERDS2TJ123	12K
R852	ERDS2TJ121	120
R853	ERDS2TJ822	8.2K
R854, 855	ERDS2TJ332	3.3K
R856	ERDS2TJ123	12K
R857	ERDS2TJ822	8.2K
R858	ERDS2TJ121	120
R859, 860	ERDS2TJ680	68

REMOTE CONTROL UNIT

R1	ERDS2TJ1R0	1

● CAPACITORS

Ref. No.	Part No.	Value
C1 ⚠	ECKDKC103PF	0.01
C4, 5	ECEA1EU102	1000
C6, 7	ECEA1CU470	47
C11, 12	ECEA1CU222	2200
C13, 14	ECEA0JU221	220
C15	ECEA1EU470	47
C18	ECEA1HU470	47
C19	ECEA1CU470	47
C101, 102	ECEA1CKS100	10
C103	RCBS1C103MYY	0.01
C104	ECQM1H104KV	0.1
C105	RCBS1H221KBY	220P
C106	ECEA1HSN010	1
C108	ECEA1HSN2R2	2.2
C109	ECEA1HSN0R1	0.1
C110	ECQM1H123KV	0.012
C111	ECQM1H152KV	0.0015
C112	ECQM1H223KV	0.022
C114	ECEA1HSN010	1
C115	ECEA1HSNR22	0.22
C116	ECQM1H123KV	0.012
C119	RCBS1C103MYY	0.01
C120, 121	RCBS1H102KBY	0.001
C122	RCBS1H681KBY	680P
C123, 124	RCBS1H102KBY	0.001
C125	ECEA1HKS0R1	0.1

Ref. No.	Part No.	Value
C126	RCBS1H220JLY	22P
C127	ECEA1HKS010	1
C128	ECFR1H104ZFM	0.1
C129, 130	ECEA1CKS100	10
C133	RCBS1H681KBY	680P
C134	ECEA0JKS220	22
C135	ECEA1HKS010	1
C136	RCBS1H221KBY	220P
C137	ECQM1H333KV	0.033
C138	RCBS1H682MXY	0.0068
C139	RCBS1H182MXY	0.0018
C140	ECEA1HKSR33	0.33
C141	ECEA0JKS470	47
C142, 143	ECEA0JKS220	22
C144	RCBS1C103MYY	0.01
C145	ECEA0JKS220	22
C146	ECQV1H104JZ	0.1
C147	RCBS1C103MYY	0.01
C148	ECKR1H102KB	0.001
C201, 202	ECQM1H104JV	0.1
C301	RCBS1H150JCY	15P
C302	ECEA1VKN2R2	2.2
C303	ECQM1H153KV	0.015
C304	ECQM1H154KV	0.15
C305	ECQM1H104KV	0.1
C306	ECKW1H102KB	0.001

Ref. No.	Part No.	Value
C307	ECEA1HKSR47	0.47
C308	ECQM1H333KV	0.033
C309	RCBS1H102KBY	0.001
C310	ECQM1H104KV	0.1
C312	RCBS1H220JCY	22P
C313	RCBS1H6R8KCY	6.8P
C314	ECQV1H104JZ	0.1
C315	RCBS1C103MYY	0.01
C317~319	RCBS1C103MYY	0.01
C320	ECQV1H104JZ	0.1
C321, 322	RCBS1H681KBY	680P
C401	ECEA0JU470	47
C402	ECFR1H104ZFM	0.1
C403	ECKR1H102KB	0.001
C404, 405	ECKR1H103ZF	0.01
C501	ECEV1EV6R8R	6.8
C502	GR426B273K25	0.027
C503, 504	ECEVICN4R7R	4.7
C505	GR426B104M25	0.1
C506	GR426F334Z25	0.33
C507	GR426F224Z25	0.22
C508, 509	GR426F104Z25	0.1
C510	GR426F104Z25	0.1
C601	RCBS1C103MYY	0.01
C701	ECQM1H333KV	0.033
C702	ECFR1H104ZFM	0.1

Ref. No.	Part No.	Value
C703	ECEA0JU470	47
C704, 705	ECCD1H470KC	47P
C801	ECEA1CU221	220
C802	ECEA0JU470	47
C803	ECEA1CU221	220
C804	ECEA0JU470	47
C805, 806	ECKR1H391KB	390P
C807, 808	ECQM1H103JV	0.01
C809, 810	ECEA1CN220S	22
C811, 812	ECKR1H102KB	0.001
C814, 815	ECKR1H102KB	0.001
C817	ECEA1EU331	330
C818	ECKD1H221KB	220P
C851, 852	ECFR1H104ZFM	0.1
C853, 854	ECFR1H104ZFM	0.1

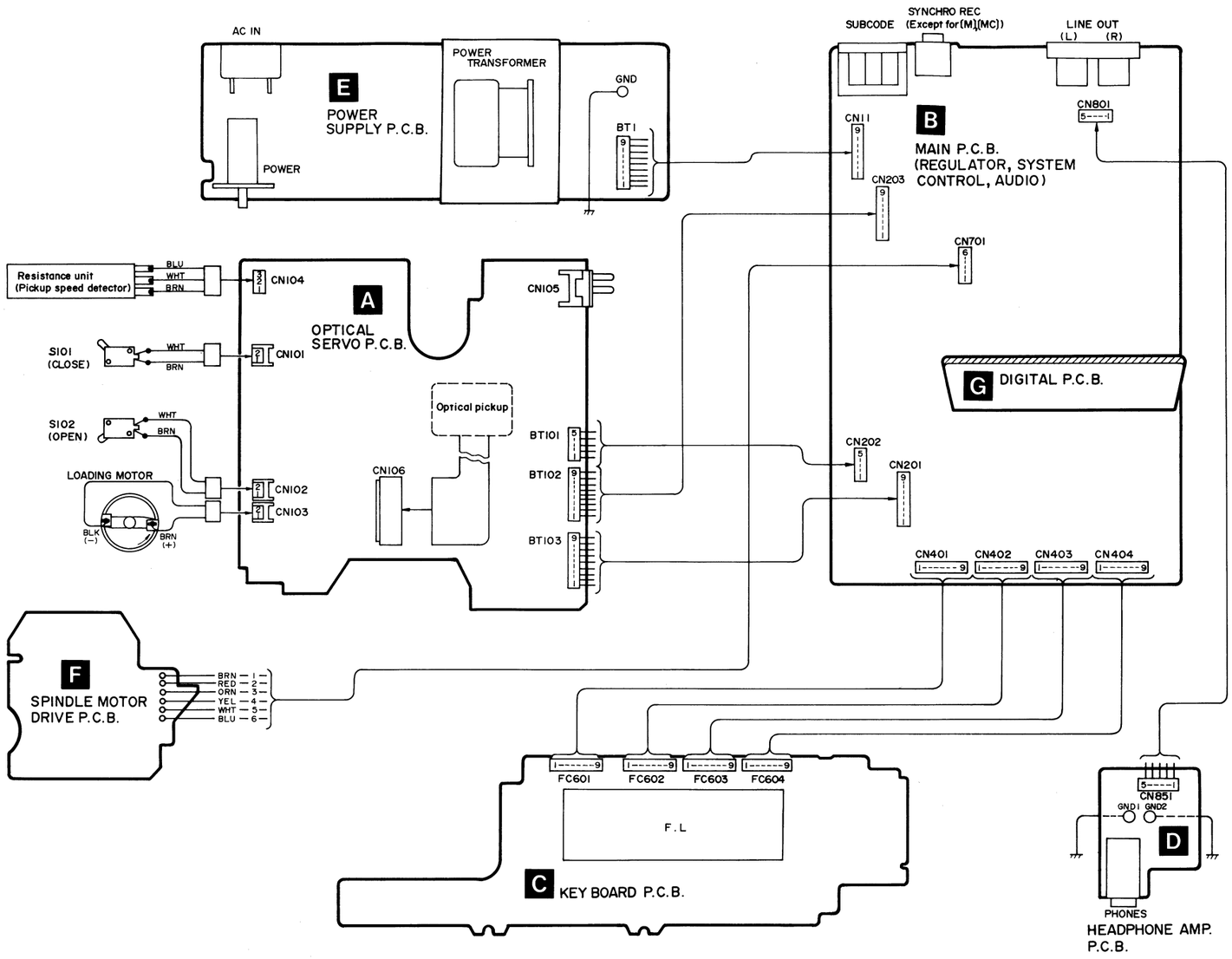
REMOTE CONTROL UNIT

C1 [M, MC]	ECKD1H101KB	100P
C1 [Other areas]	ECKD1H471KB	470P
C2 [M, MC]	ECKD1H101KB	100P
C2 [Other areas]	ECKD1H121KB	120P

■ TERMINAL FUNCTION OF MN15261PDC1

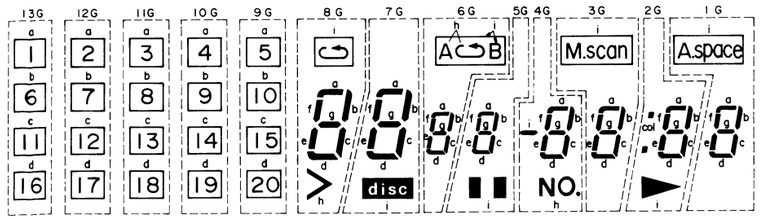
Pin No.	Mark	Signal	I/O Device	Function
1	VSS	GND	I	GND terminal
2	X0	——	O	Not used (Open)
3	XI	——	I	Not used (Open)
4	P00	$\overline{\text{TTON}}$	O	Spindle motor control signal (ON · OFF command)
5	P01	M DATA	O	Command data output
6	P02	MCLK	O	Command clock output
7	P03	MLD	O	Command load output
8	P10	M-RELAY	O	Muting relay control
9	P11	D-MUTE	O	Muting control
10	P12	$\overline{\text{SYNC REC}}$	O	Synchro recording control
11	P13	$\overline{\text{SYNC SRT}}$	O	Direct operation control
12	$\overline{\text{SYNC}}$	——	O	Not used (Open)
13	$\overline{\text{RST}}$	RESET	I	Reset signal input (reset at "L")
14	$\overline{\text{IRQ}}$	BLOCK	I	Sub-code block (Q data) clock (75 Hz) input
15 ≀ 18	P50 ≀ P53	——	I	Key scan input
19	$\overline{\text{SBT}}$	$\overline{\text{CLDCK}}$	I	Sub-code frame clock (7.35 kHz)
20	$\overline{\text{SBD}}$	SUBQ	I	Sub-code Q data input
21	P20	SEEK	O	Rough search ON · OFF signal
22	P21	$\overline{\text{TRAV}}$	O	Traverse servo control signal
23	P22	$\overline{\text{REV}}$	O	Traverse reverse command signal
24	P23	$\overline{\text{FWD}}$	O	Traverse forward command signal
25	P30	CNT4	O	Optical servo IC control signal (KICKR : Kick direction [Reverse] command)
26	P31	CNT3	O	Optical servo IC control signal (KICKF : Kick direction [Forward] command)
27	P32	CNT2	O	Optical servo IC control signal ($\overline{\text{TRON}}$: Tracking servo)
28	P33	CNT1	O	Optical servo IC control signal ($\overline{\text{FOON}}$: Focus servo)
29	P40	STAT	I	Key input strobe and processing status input from signal processing LSI traverse position detection.
30	P41	$\overline{\text{COMP}}$	I	Traverse position input
31	P42	$\overline{\text{FLOCK}}$	I	Optical servo condition (focus) input
32	P43	$\overline{\text{SENSE}}$	I	Optical servo condition (track cross) input
33	PE0	$\overline{\text{CLOSE}}$	O	Loading motor close command (ON at "L")
34	PE1	$\overline{\text{OPEN}}$	O	Loading motor open command (ON at "L")
35	P60	FFRST	O	Not used (Open)
36	P61	——	O	——
37	DAC	DAC DATA	O	Traverse drive output
38	VPP	——	I	FL drive power supply (connected to −34V)
39 ≀ 52	D0 ≀ DD	——	O	FL grid signal and key scan signal
53 ≀ 61	S8 ≀ S0	——	O	FL anode signal
62	OSC 2	——	I	Not used (Open)
63	OSC 1	——	I	Clock input
64	VDD	——	I	Power supply (connected to +5V)

■ PRINTED CIRCUIT BOARD AND WIRING CONNECTION DIAGRAM



■ INTERNAL CONNECTIONS OF FL

- **Grid connection diagram**

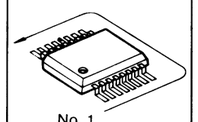


- **Anode connection table**

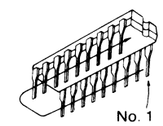
Pin NO.	4 (13G)	6 (12G)	8 (11G)	10 (10G)	12 (9G)	14 (8G)	16 (7G)	18 (6G)	20 (5G)	22 (4G)	24 (3G)	26 (2G)	28 (1G)
5(a)	1	2	3	4	5	a	a	a	a	a	a	a	a
7(b)	6	7	8	9	10	b	b	b	b	b	b	b	b
9(c)	11	12	13	14	15	c	c	c	c	c	c	c	c
11(d)	16	17	18	19	20	d	d	d	d	d	d	d	d
19(e)	—	—	—	—	—	e	e	e	e	e	e	e	e
21(f)	—	—	—	—	—	f	f	f	f	f	f	f	f
23(g)	—	—	—	—	—	g	g	g	g	g	g	g	g
25(h)	—	—	—	—	—	>	—	A ⇄	—	NO.	—	col	—
27(i)	—	—	—	—	—	⇄	disc	B	▮▮	⬭	M.scan	▶	A.space

- **Terminal guide of IC's, transistors and diodes**

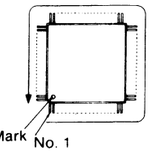
AN8370S ····· 42pin
MN4053BS ····· 16pin
AN6554NS ····· 14pin
MN4416S ····· 24pin
AN8371S ····· 24pin
MN1551PDD ····· 28pin



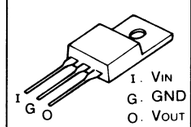
AN6552 ····· 8pin
AN6914 ····· 8pin
MN15261PDC ····· 64pin
SVIPCM54KP ····· 28pin
SVILM833NA ····· 8pin



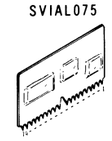
MN6617F ····· 84pin
MN6618F ····· 42pin



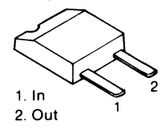
AN78M12, AN78M05



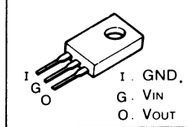
SVIAL075



SVIFU15



AN79N12, AN79N05



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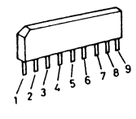
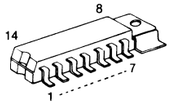
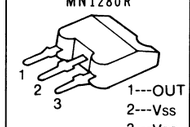


AN8280LF

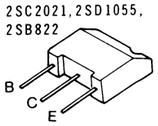


MN1280R

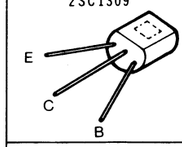


SVIBX1327M
SVIBX1328E

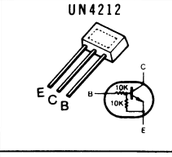
2SD973, 2SB793,
2SC2021, 2SD1055,
2SB822



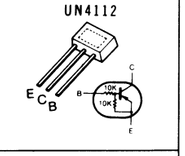
2SC1309



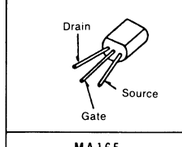
UN4212



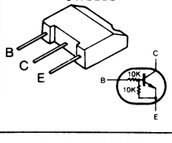
UN4112



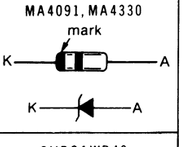
2SK301



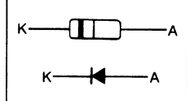
UN1212



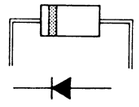
MA4082, MA4056,
MA4091, MA4330



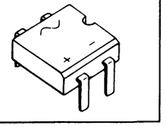
MA165



SVDISR35200V



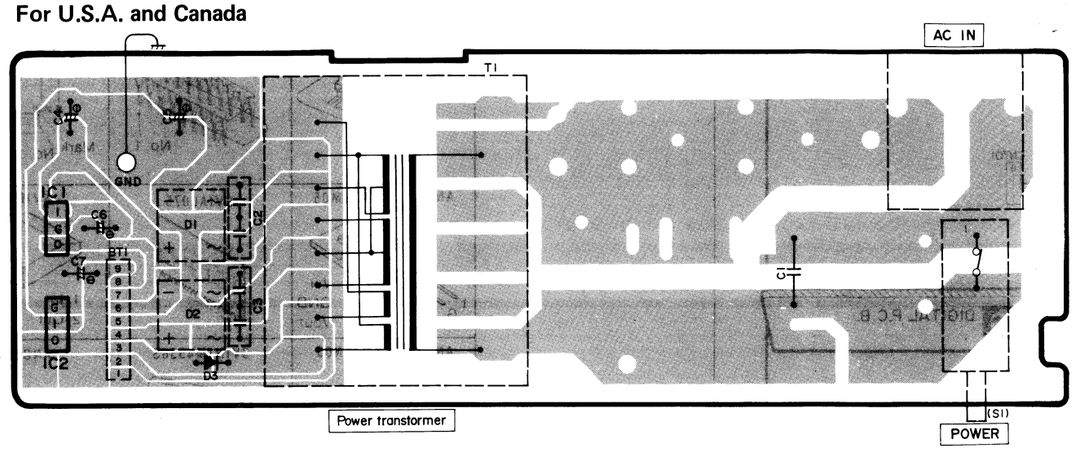
SVDS1WB40



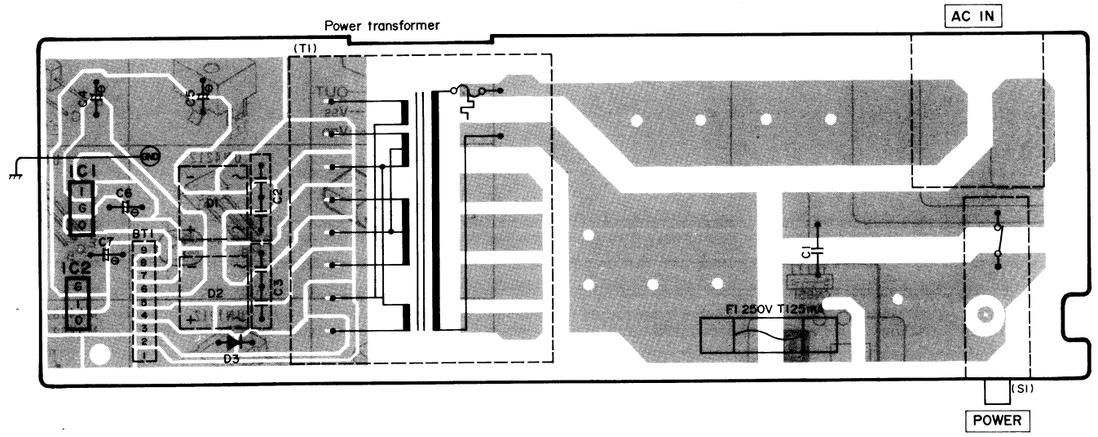
■ PRINTED CIRCUIT BOARDS

E (Power supply P.C.B.)

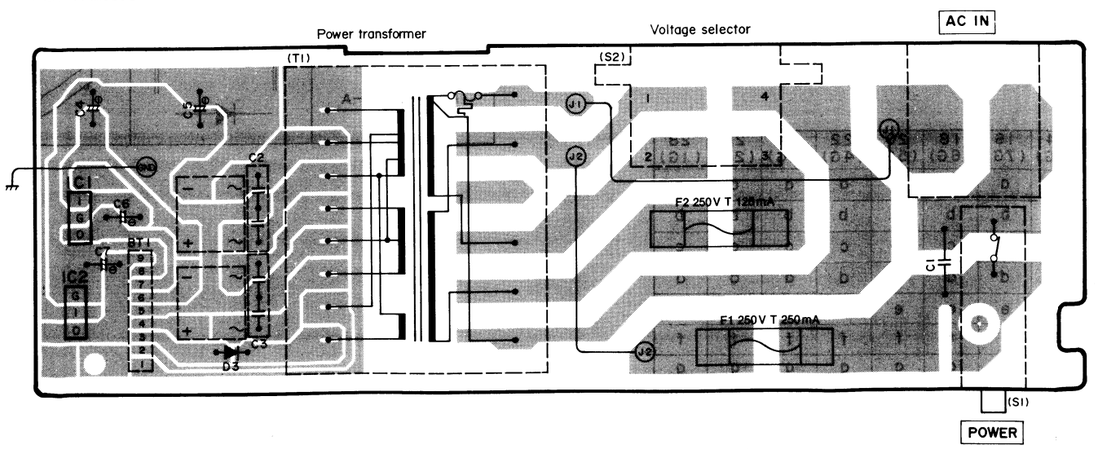
- For U.S.A. and Canada



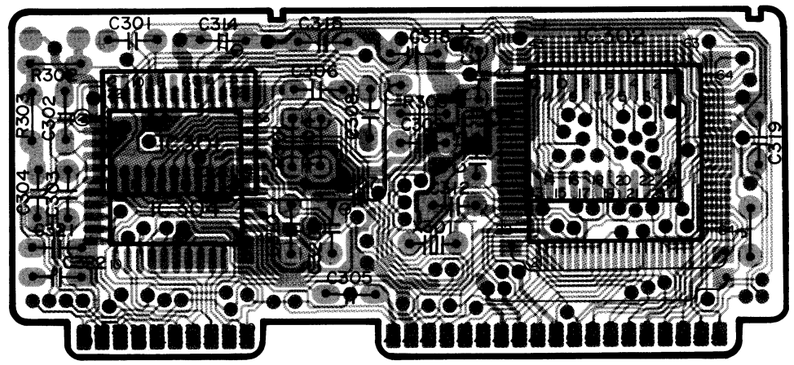
- For United Kingdom, Australia and Contnental Europe



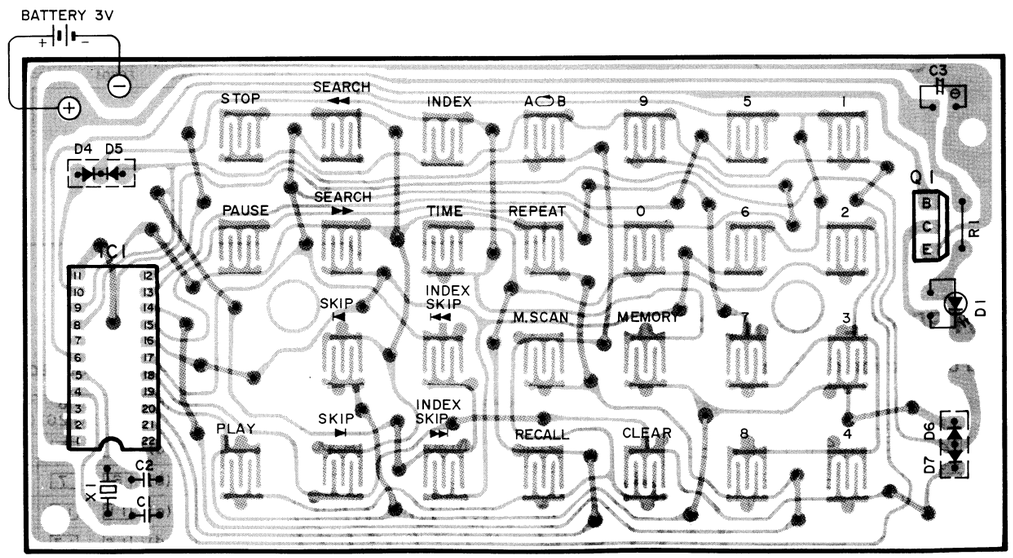
- For Others



G (Digital P.C.B.)

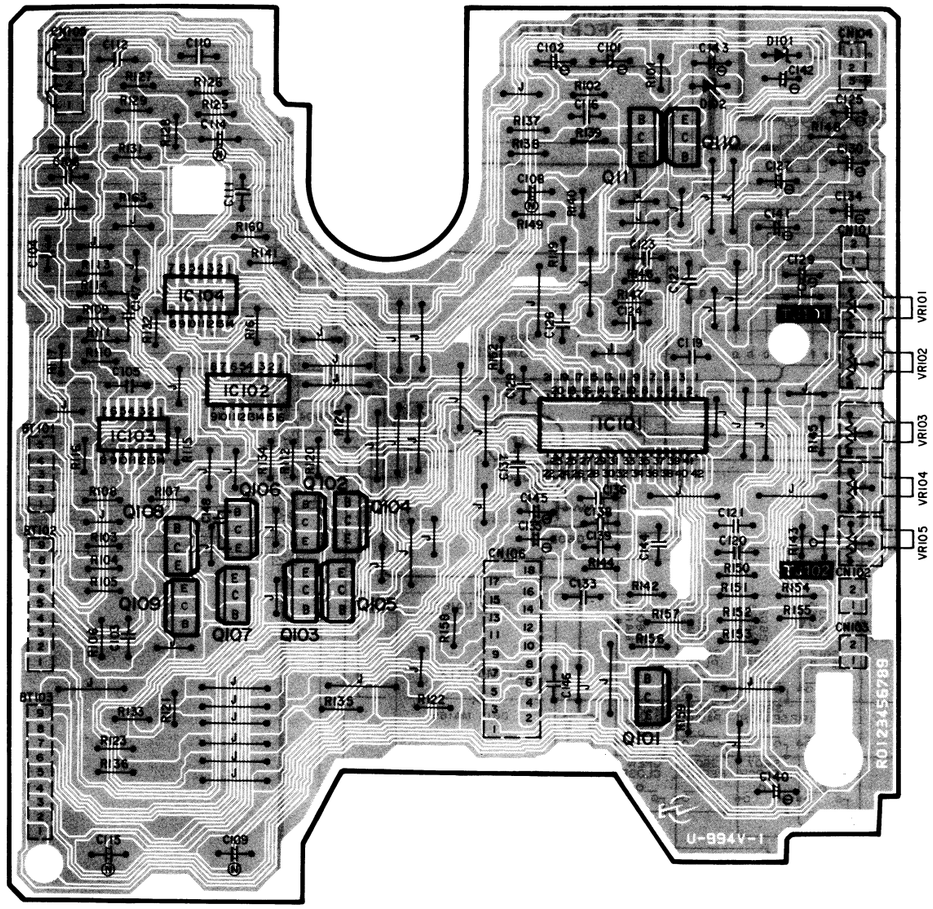


- Remote Control Transmitter

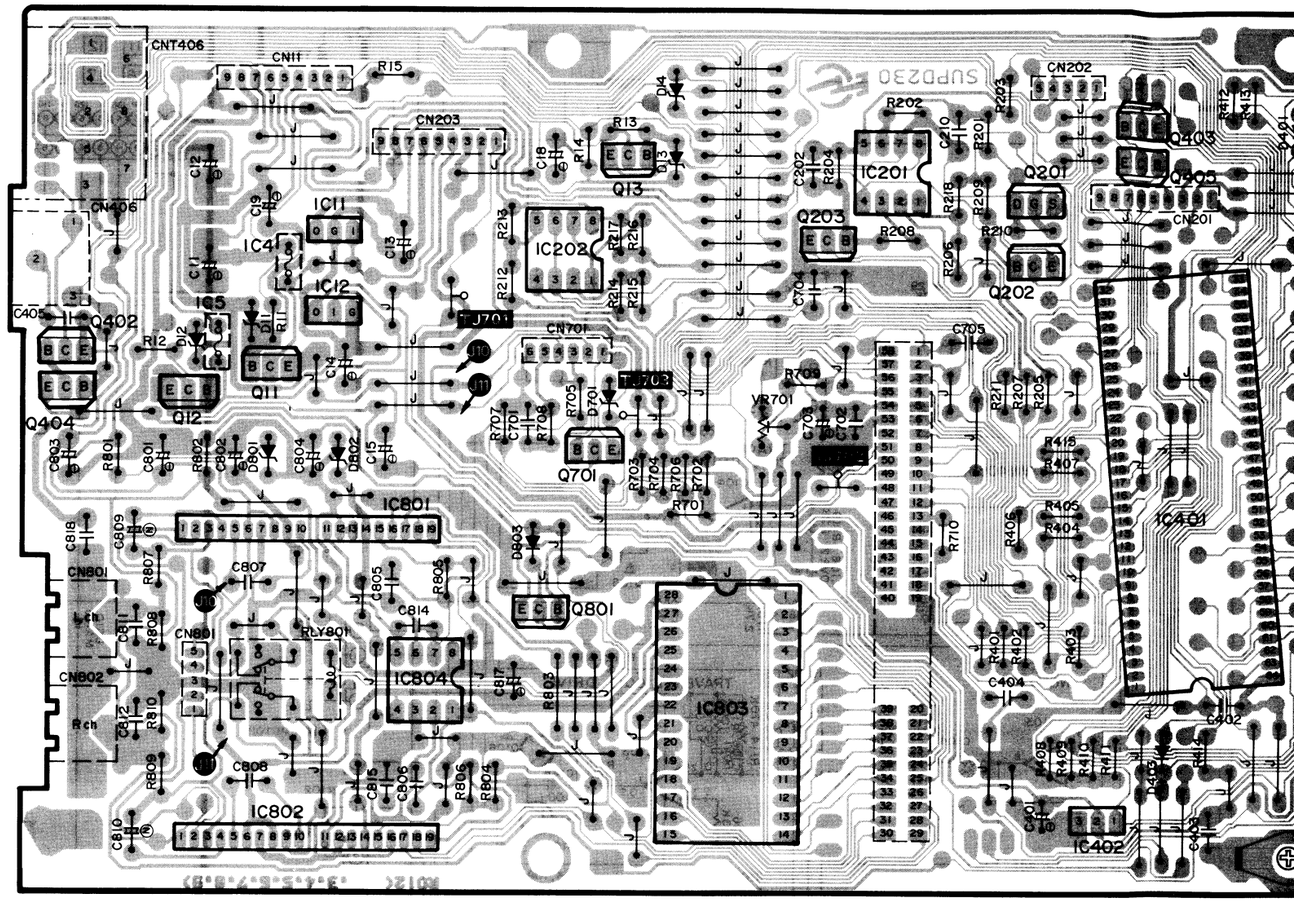


11 12 13 14 15 16 17 18 19 20 21

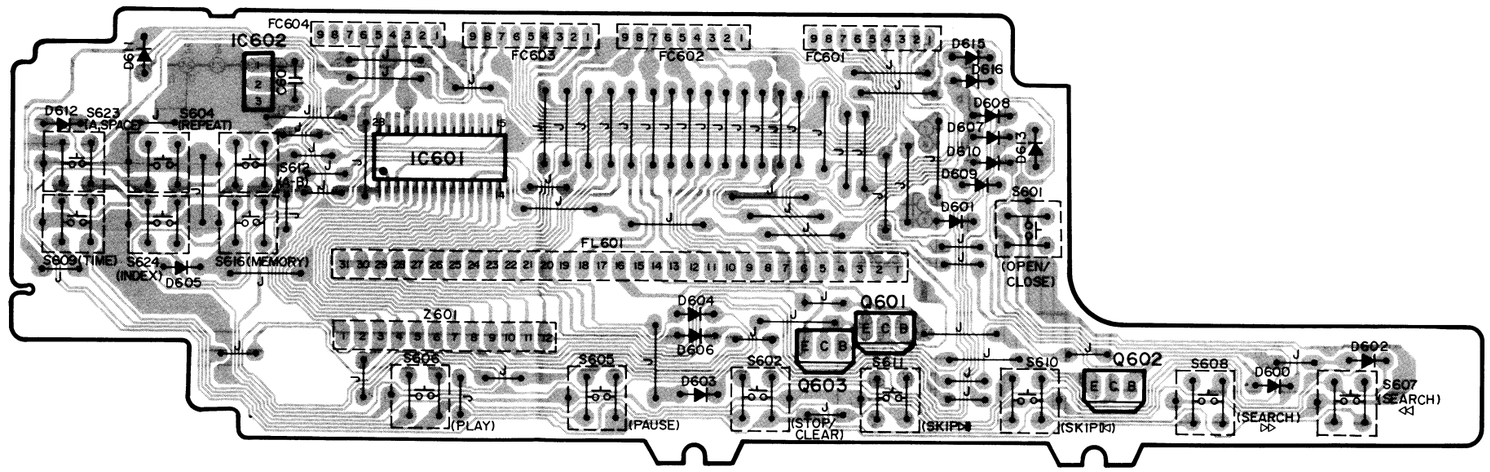
A (Optical servo P.C.B.)



D (Main P.C.B.: Regulator, system control, audio)

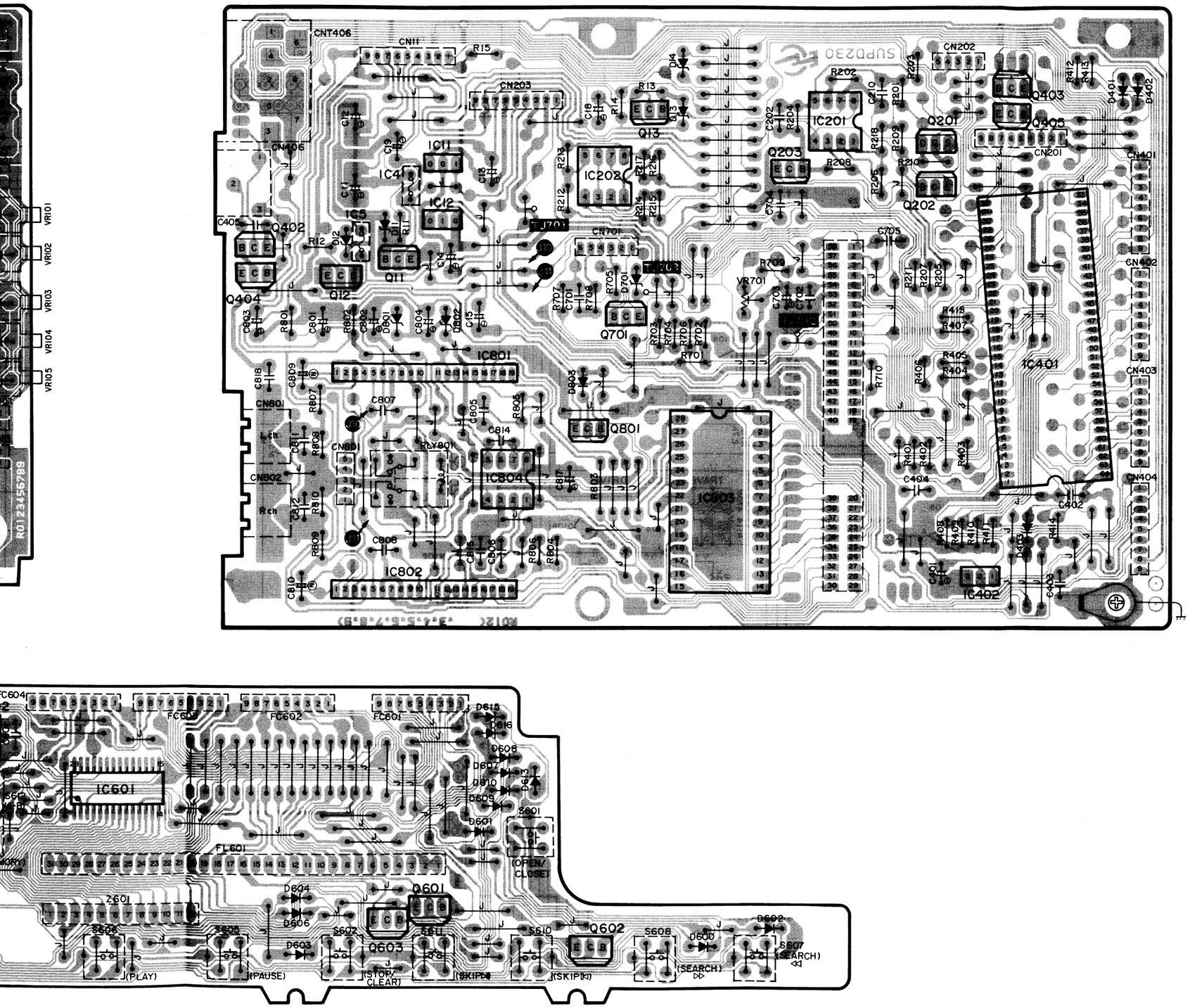


C (Keyboard P.C.B.)



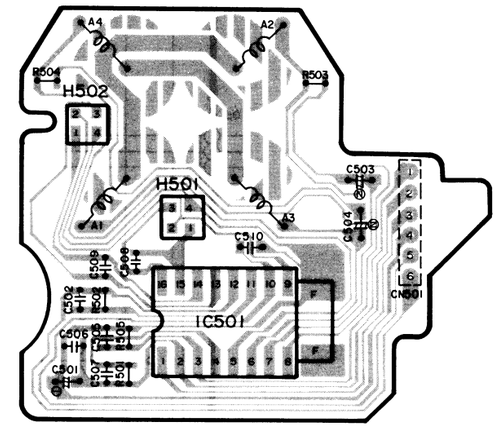
15 16 17 18 19 20 21 22 23 24

D (Main P.C.B.: Regulator, system control, audio)

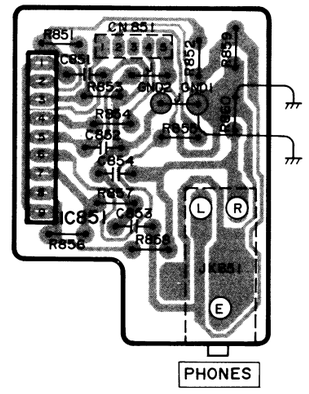


F (Spindle motor drive P.C.B.)

Notes: The spindle motor drive circuit board is made by iron. It is very difficult to replace the parts on the circuit board. So, the repair parts are supplied in the from of finished P.C.B.

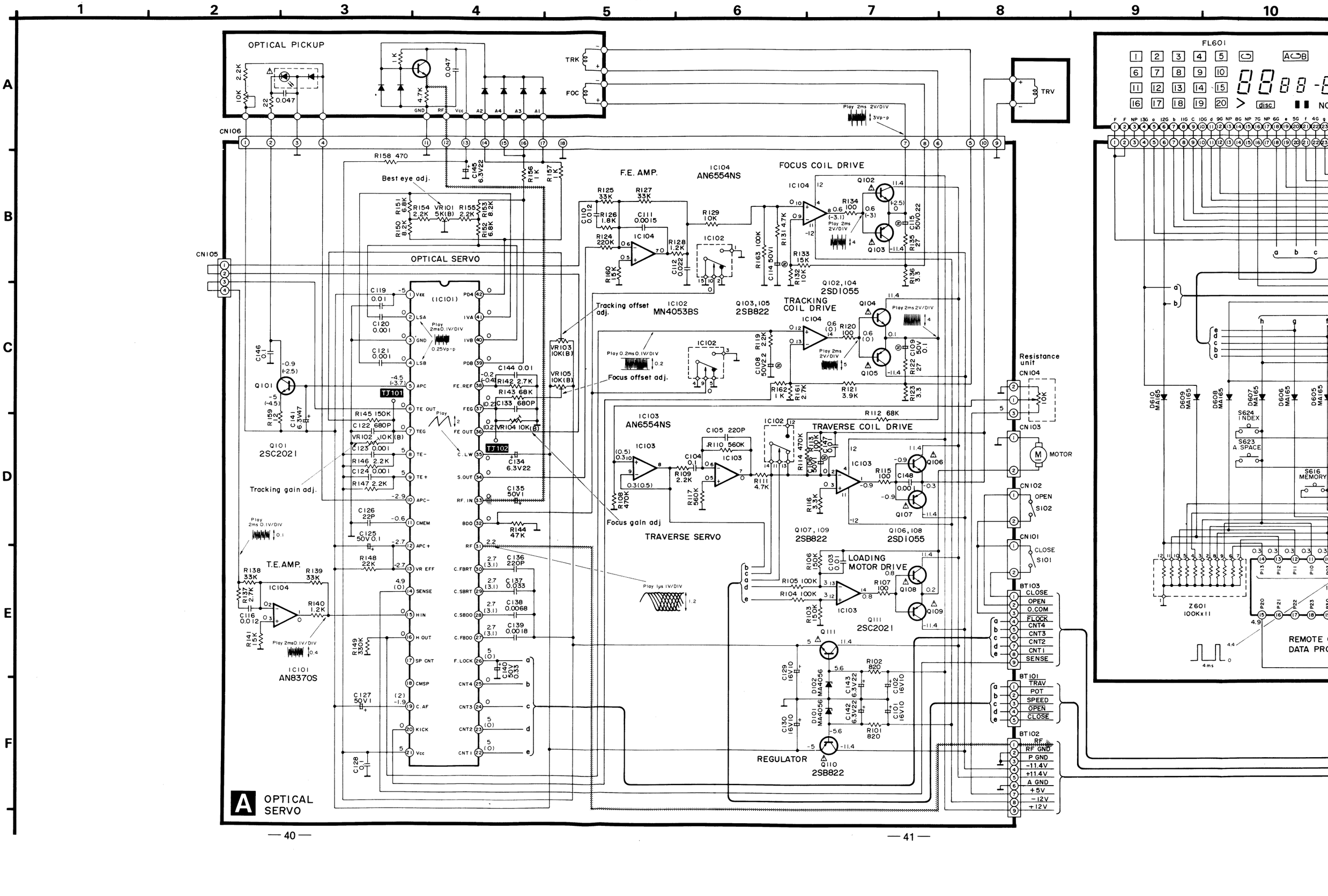


D (Headphone amp. P.C.B.)



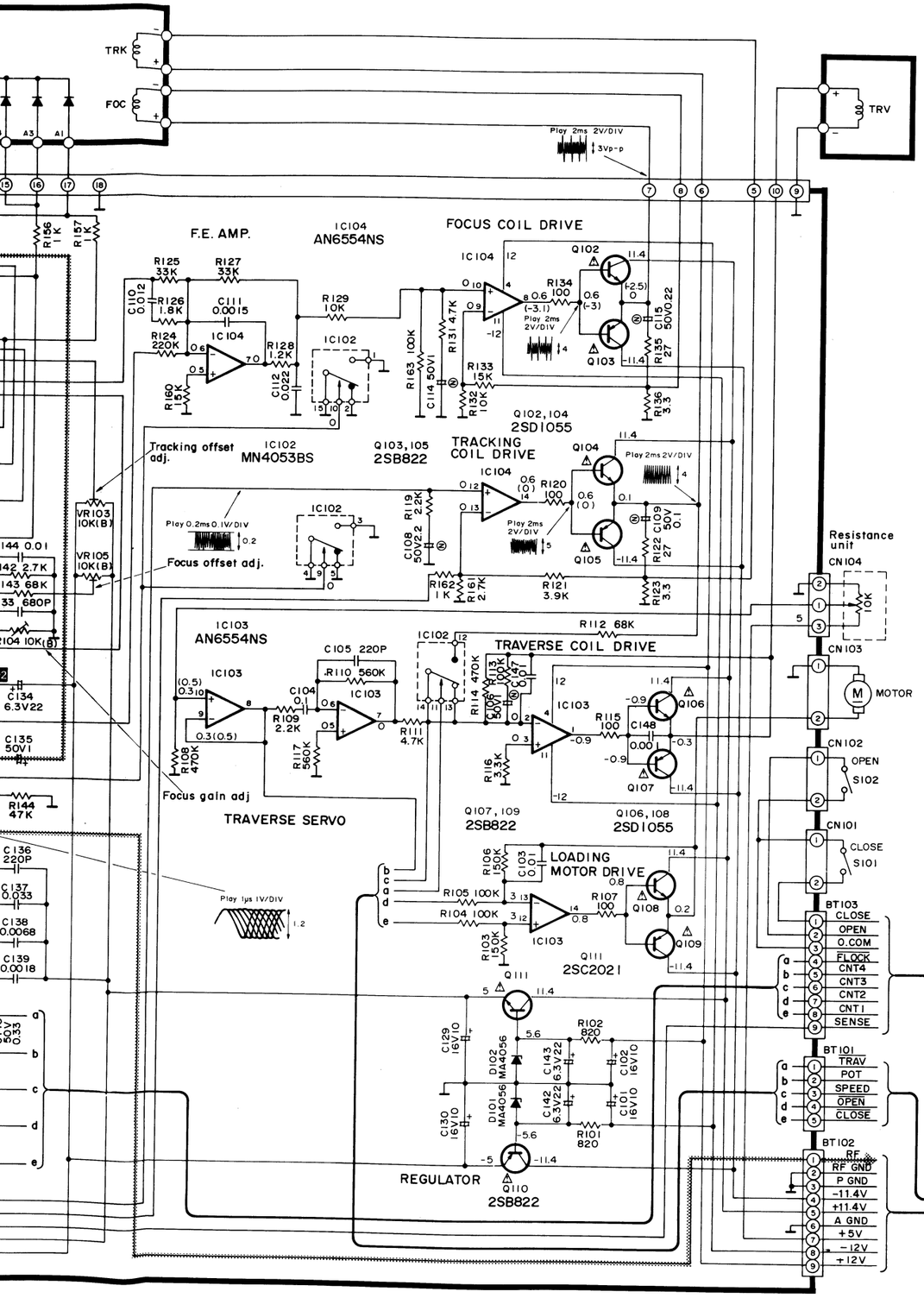
SL-PJ33 SL-PJ33

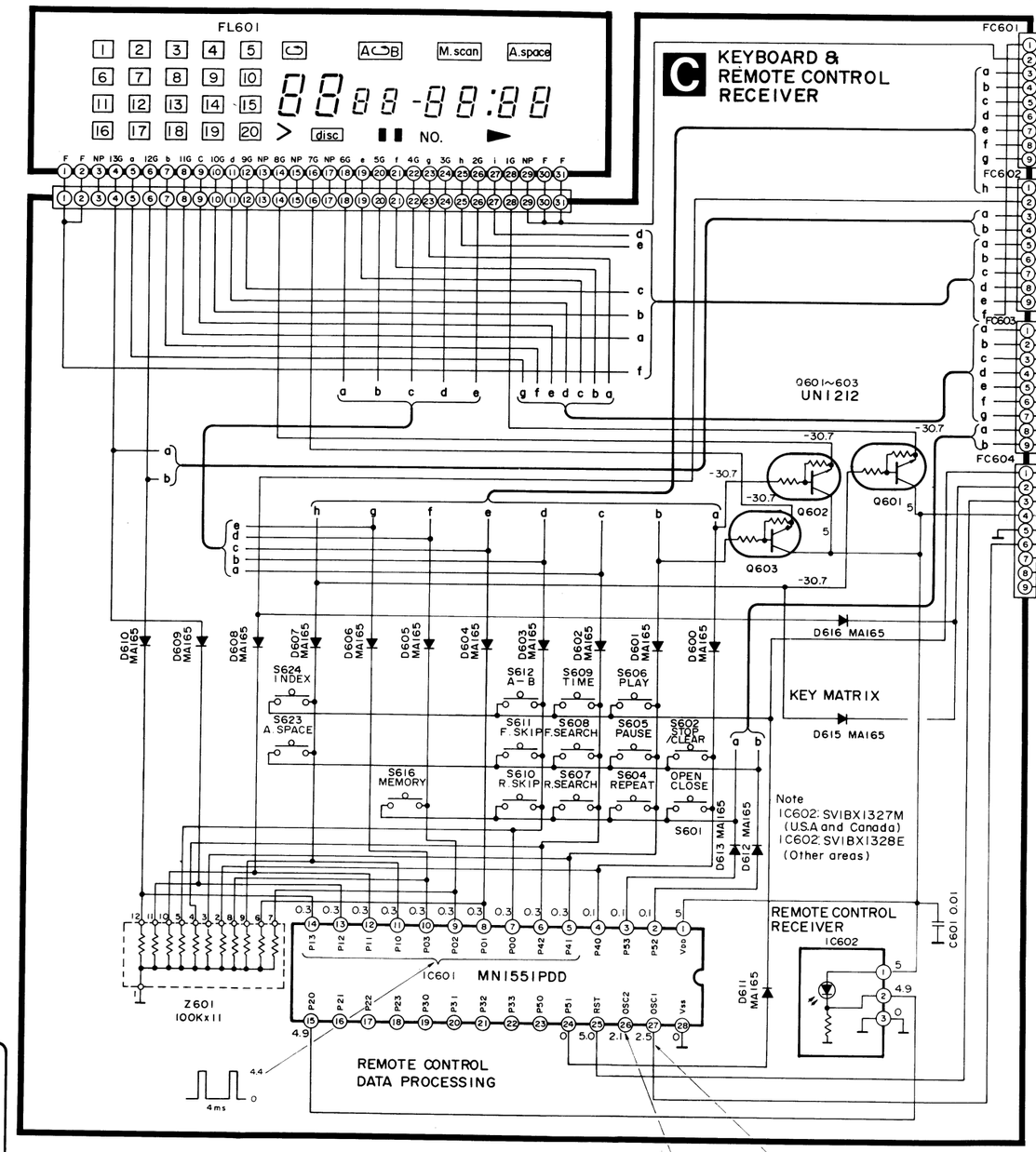
■ SCHEMATIC DIAGRAM (This schematic diagram may be modified at anytime with the development of new technology.)



development of new technology.)

5 6 7 8 9 10 11 12 13 14





15 16 17 18 19 20 21 22 23 24 25

B FL DRIVE, SYSTEM CONTROL, REGULATOR & AUDIO

IC401 MN15261PDC FLDRIVE/SYSTEM CONTROL

IC11 AN78M05 IC12 AN79N05 REGULATOR

IC4,5 SVIFU15

Q11 2SD973 Q13 2SA1309 Q12 2SB793

Q701 UN4212 Q801 UN4112

IC202 AN6914

IC201 AN6552

IC402 MN1280-R

IC801 SVIALO75L

IC802 SVIALO75R

IC803 SVIPCM54KP

IC804 SVILM833NA

TRAVERSE SERVO

RESET SIGNAL GENERATION

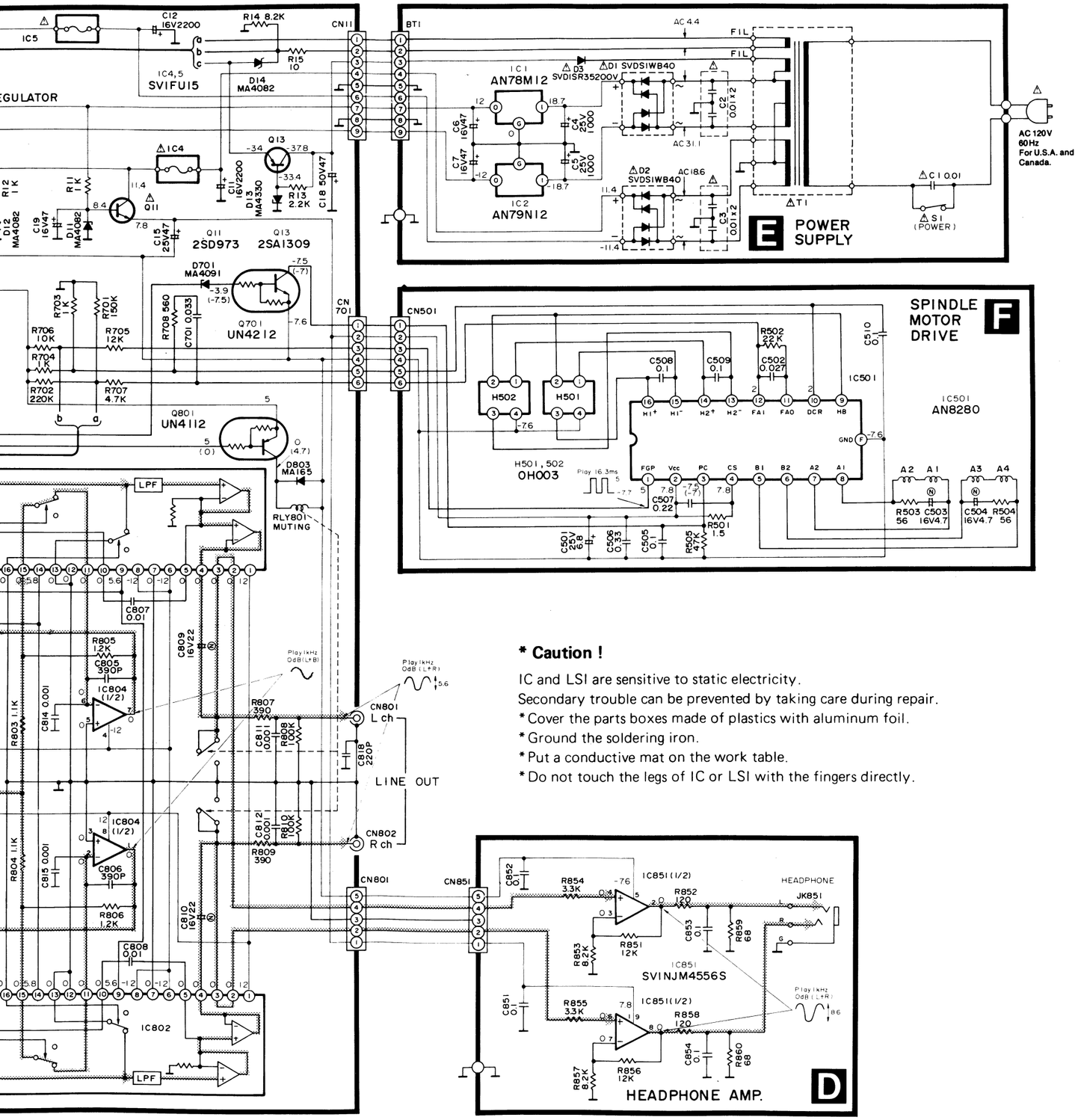
D/A CONVERTER

SYNCHRO REC & START DRIVE

AUDIO (DEGLITCH, LPF)

LINE OUT

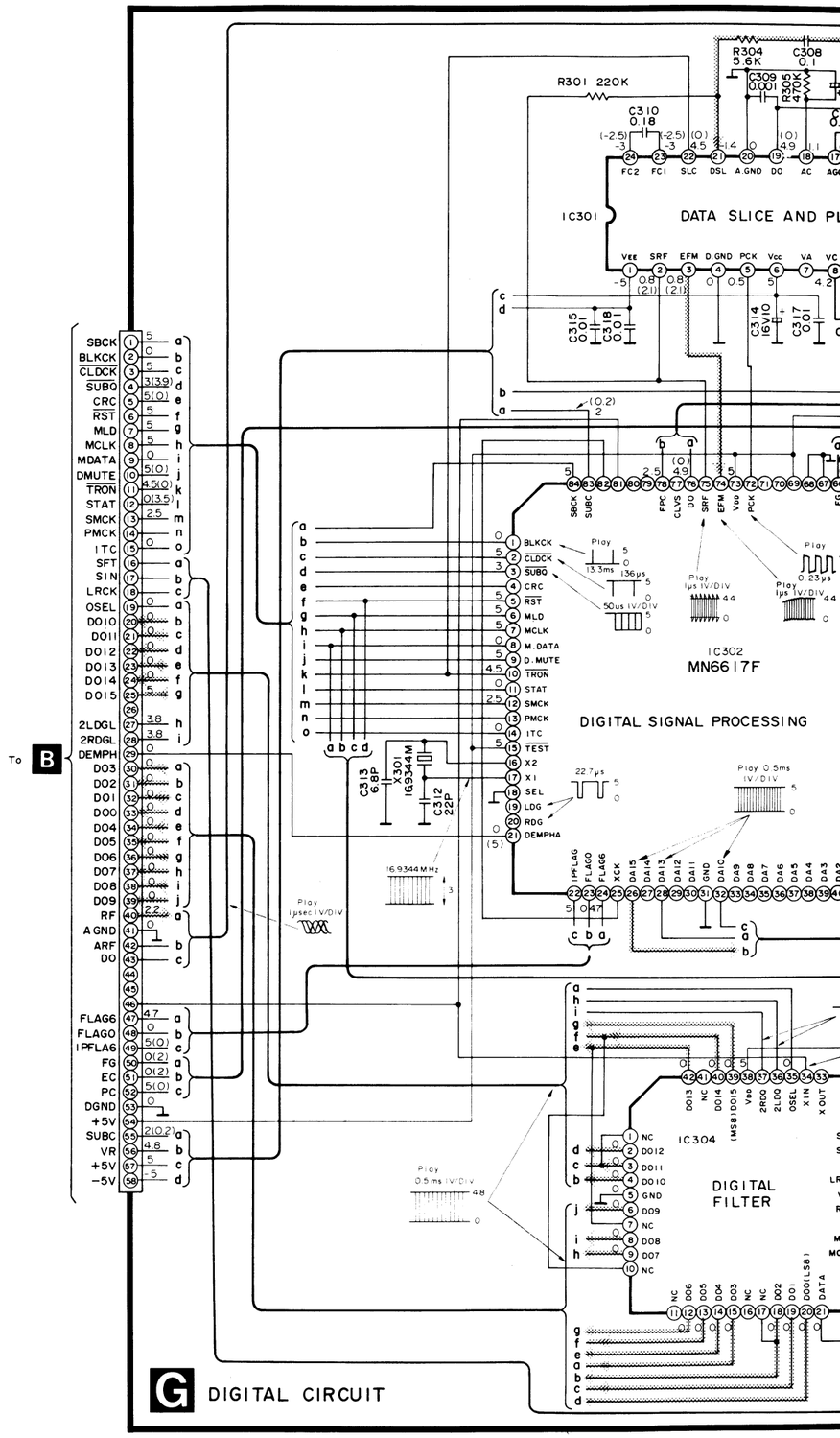
Note: Except for U.S.A. and Canada.

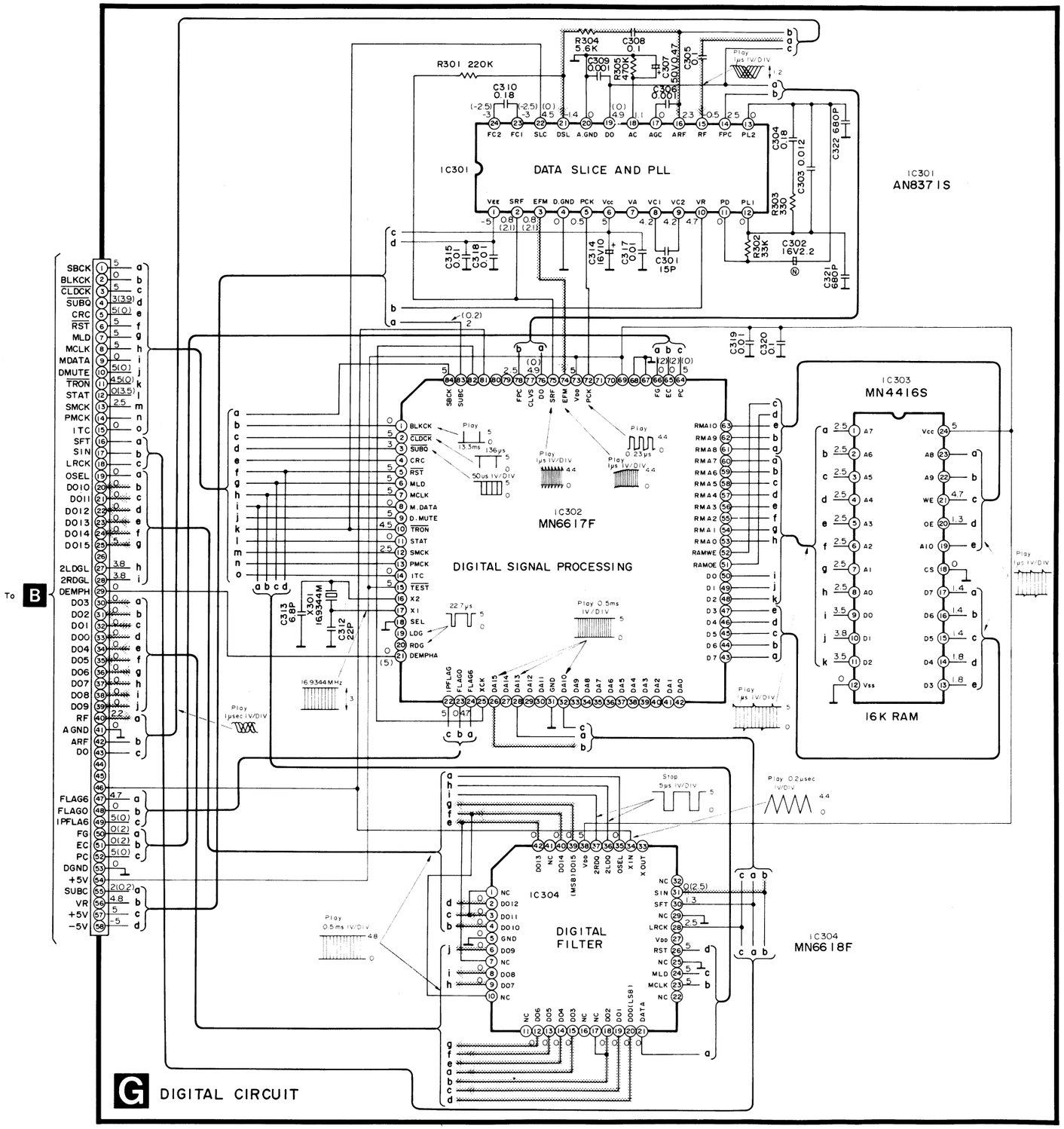


*** Caution !**

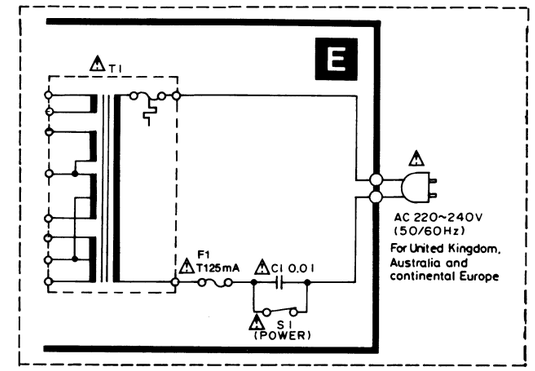
IC and LSI are sensitive to static electricity.
Secondary trouble can be prevented by taking care during repair.

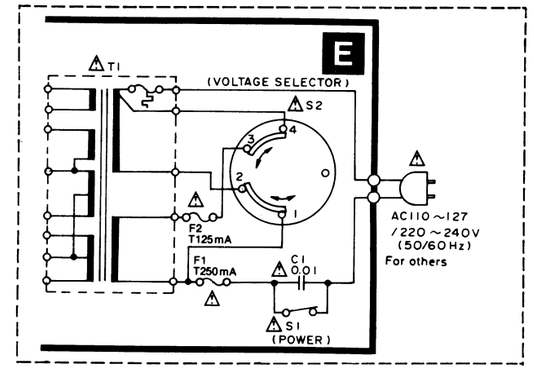
- * Cover the parts boxes made of plastics with aluminum foil.
- * Ground the soldering iron.
- * Put a conductive mat on the work table.
- * Do not touch the legs of IC or LSI with the fingers directly.


To B
R304 5.6K
C308 0.1
C309 0.001
R305 470K
R301 220K
C310 0.18
IC301
DATA SLICE AND PL
FC2 FC1 SLC DSL A.GND DO AC AGC
C315 0.01
C318 0.01
C314 16V10
C317 0.01
SBCK BLKCK CLDCK SUBQ CRC RST MLD MCLK MDATA DMUTE TRON STAT SMCK PMCK ITC SFT SIN LRCK OSEL DO10 DO11 DO12 DO13 DO14 DO15 2LDGL 2RDGL DEMPH DO3 DO2 DO1 DO0 DO4 DO5 DO6 DO7 DO8 DO9 RF AGND ARF DO FLAG6 FLAG0 IPFLA6 FG EC PC DGND +5V SUBC VR +5V -5V
IC302 MN6617F
DIGITAL SIGNAL PROCESSING
M.DATA D.MUTE TEST X2 X1 SEL LDG RDG DEMPHA
C313 6.8P
X301 16.9344M
C312 22P
16.9344MHz
IC304
DIGITAL FILTER
G DIGITAL CIRCUIT



- **Power supply circuit**

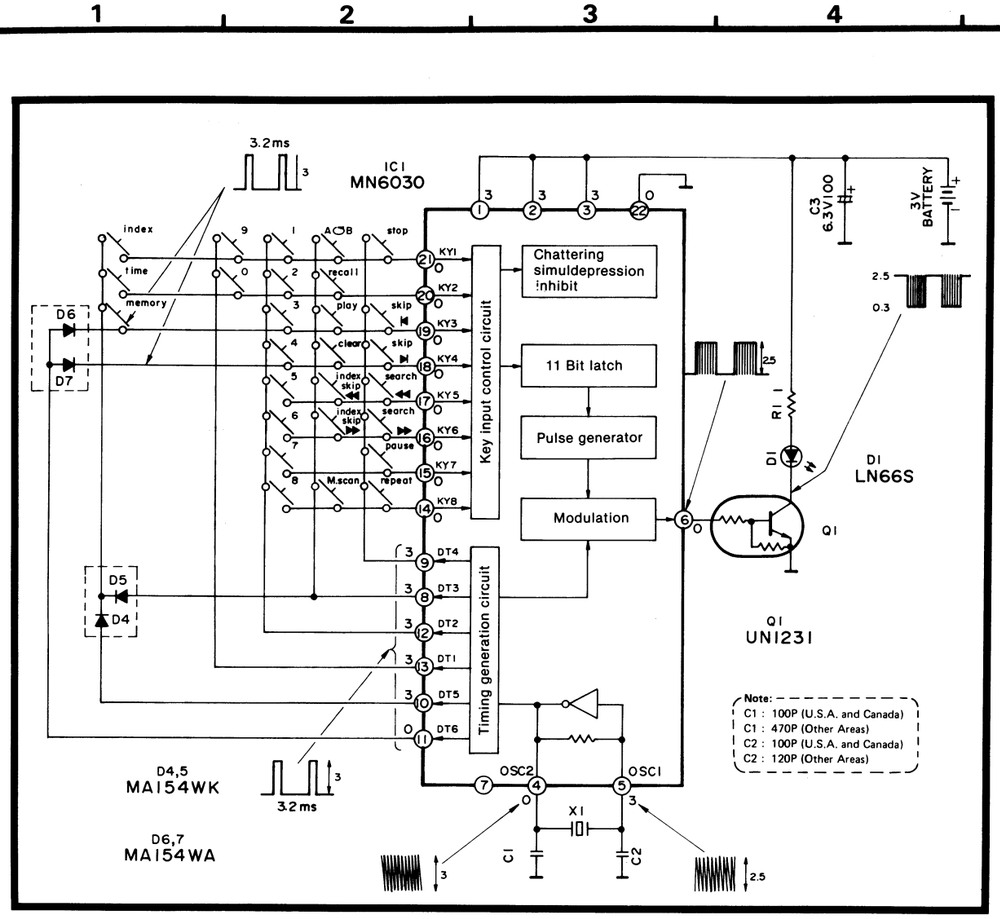




Notes:

1. **S1** : Power switch.
2. **S2** : Voltage selector switch.
   (For [XA], [XM], [PA], [PE] and [PC] areas.)
3. **S101** : Disc holder close detection switch.
4. **S102** : Disc holder open detection switch.
5. **S601** : Open/close switch.
6. **S602** : Stop/Clear switch.
7. **S604** : Repeat switch.
8. **S605** : Pause switch.
9. **S606** : Play switch.
10. **S607** : Backward search switch.
11. **S608** : Forward search switch.
12. **S609** : Time mode selector switch.
13. **S610** : Backward skip switch.
14. **S611** : Forward skip switch.
15. **S612** : A – B repeat switch.
16. **S616** : Memory switch.
17. **S623** : Auto space switch.
18. **S624** : Index switch.
19. The voltage value and waveform are the reference voltage of this unit measured by DC electronic voltmeter (high impedance) and oscilloscope on the basis of chassis.
    Accordingly, there may arise some error in voltage values and waveforms depending upon the internal impedance of the tester or the measuring unit.
    * The parenthesized are the values of voltage generated during playing (Test disc 1 kHz, L + R, 0 dB), other are voltage values in stop mode.
20. Important safety notice:
    Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
21. ——— : Positive voltage lines and negative voltage lines.
    ▒▒▒ : Audio signal lines.

■ SCHEMATIC DIAGRAM (Remote Control Unit)



* Caution !

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Secondary trouble can be prevented by taking care during repair.

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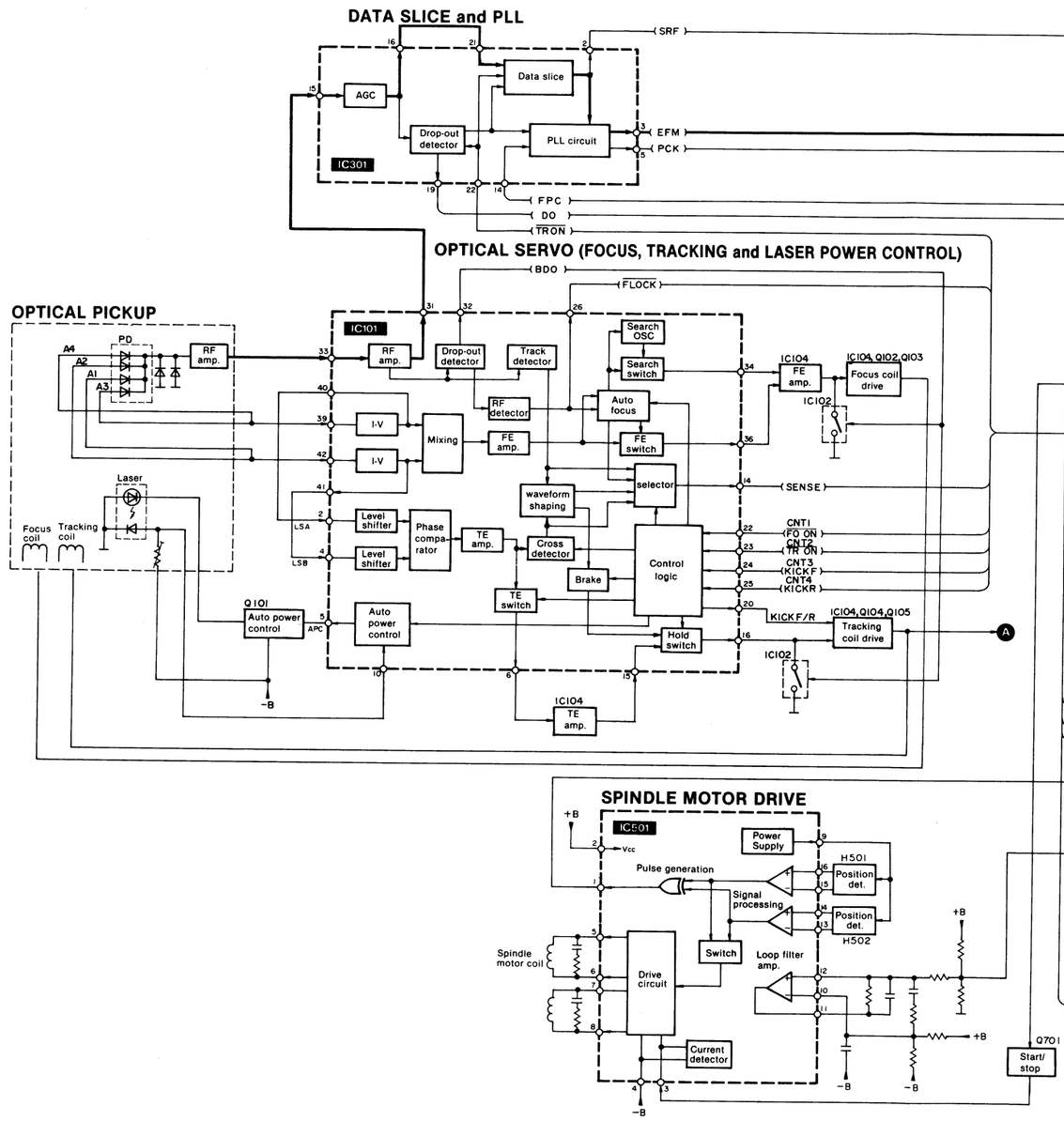
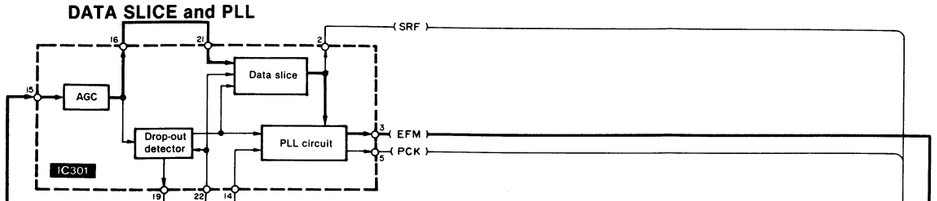
* Ground the soldering iron.
* Put a conductive mat on the work table.
* Do not touch the legs of IC or LSI with the fingers directly.

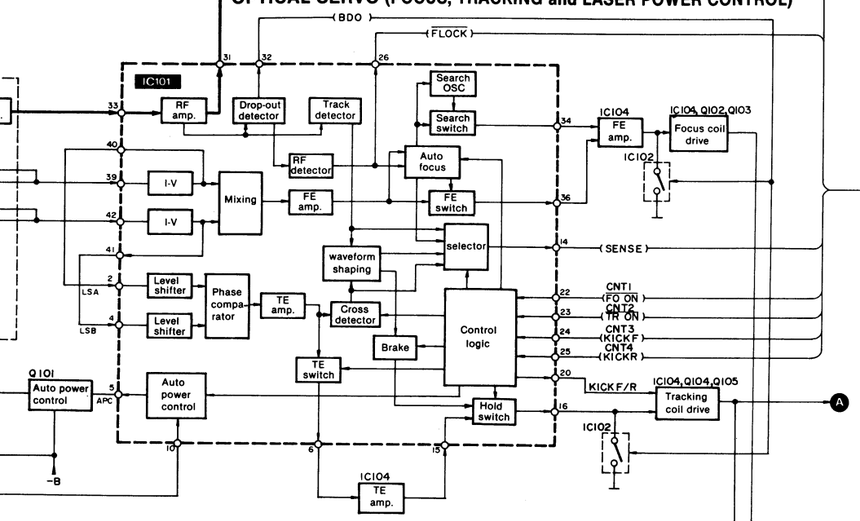
■ BLOCK DIAGRAM



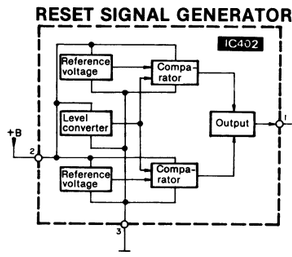
DATA SLICE and PLL



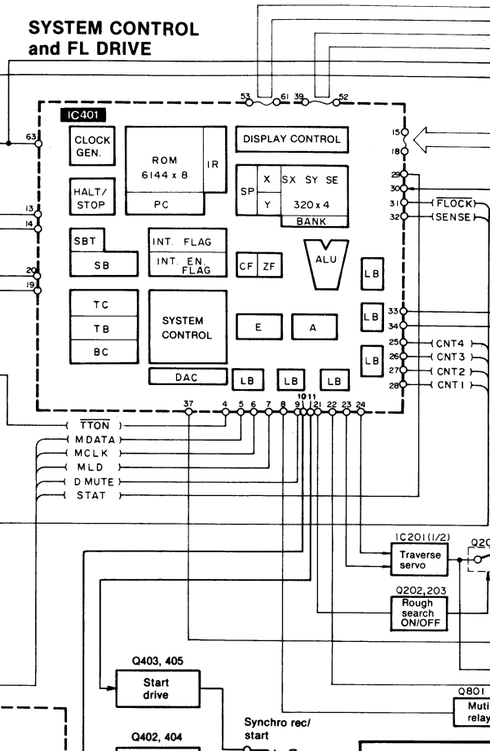
OPTICAL SERVO (FOCUS, TRACKING and LASER POWER CONTROL)



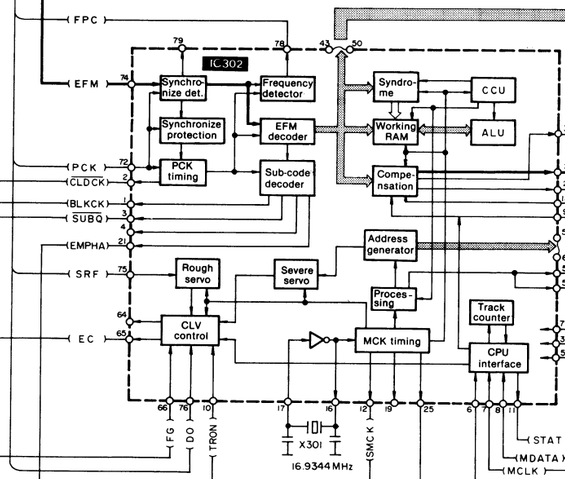
RESET SIGNAL GENERATOR



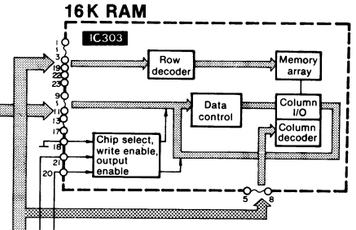
SYSTEM CONTROL and FL DRIVE



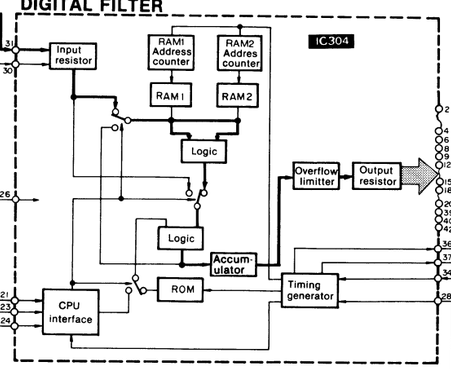
E.F.M. DECODER, ERROR CORRECTION and CLV SERVO



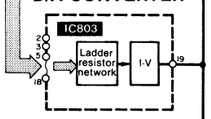
16K RAM

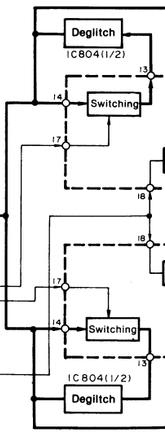


DIGITAL FILTER

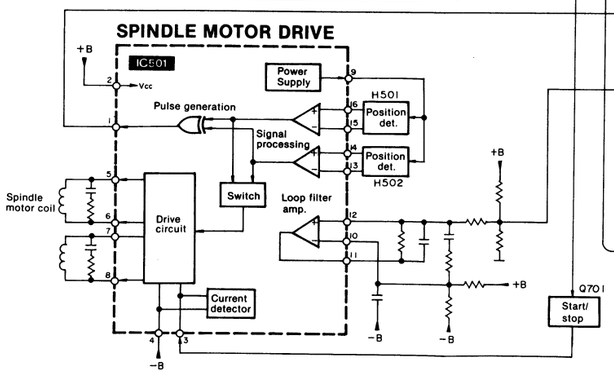


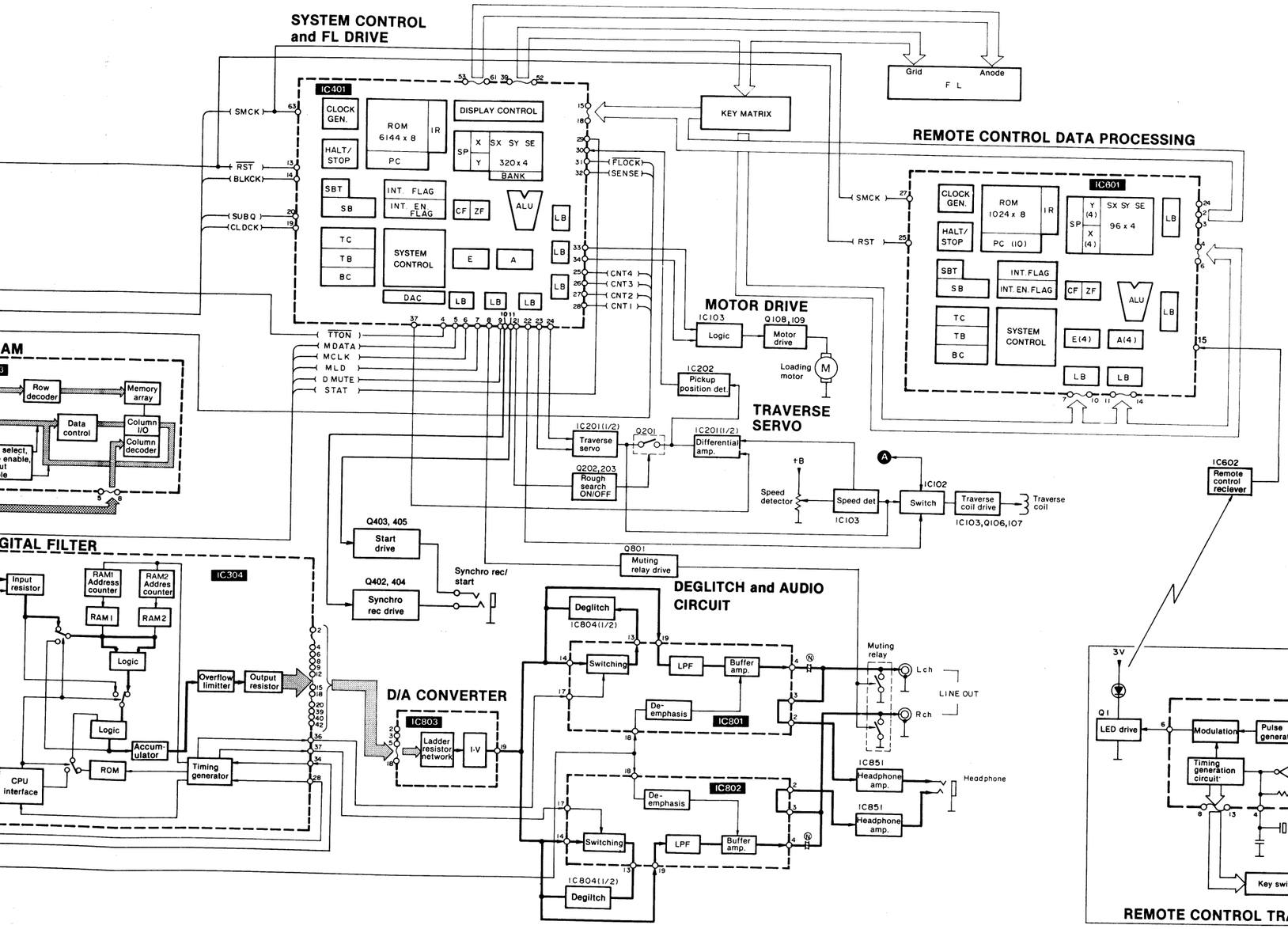
D/A CONVERTER

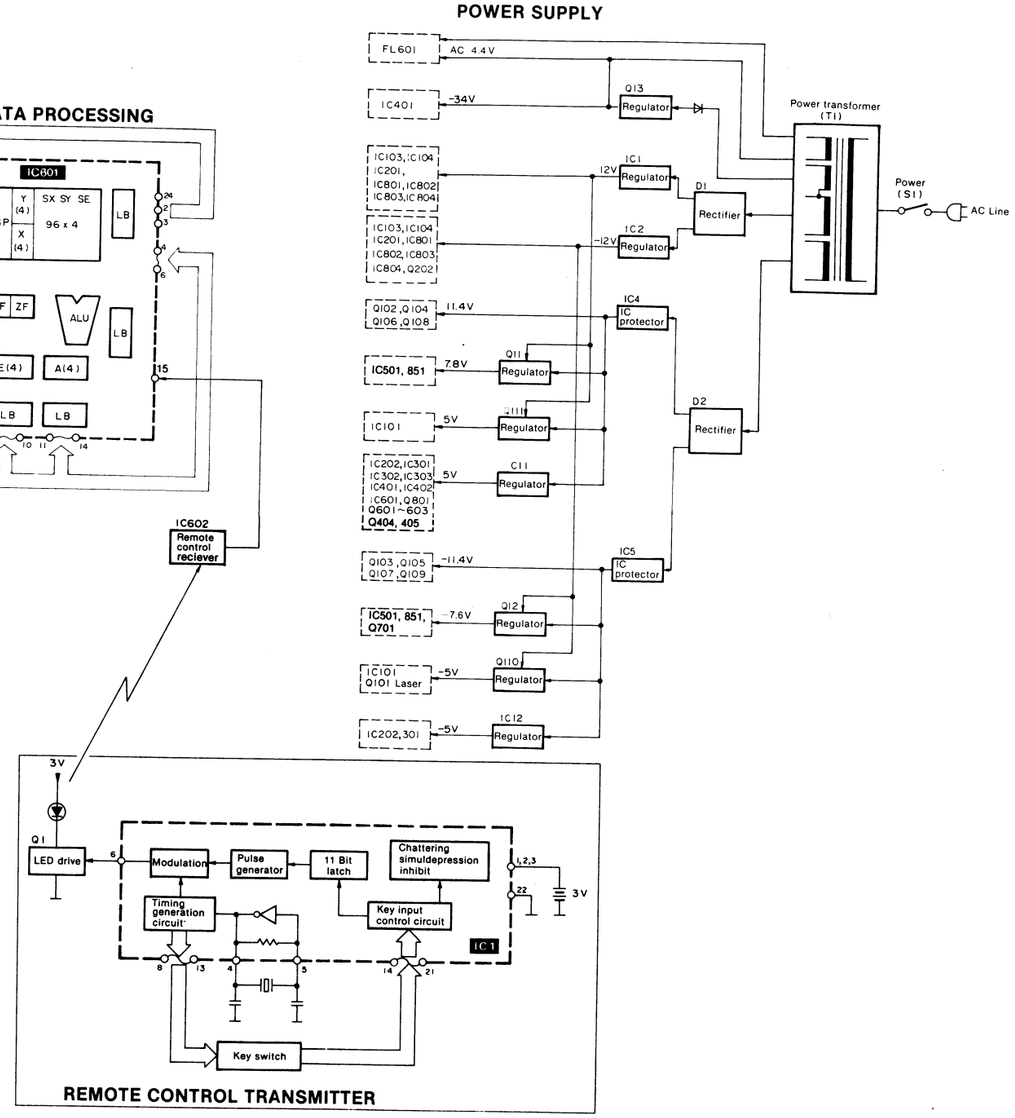




SPINDLE MOTOR DRIVE







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